This work was the first Dispensatory published in America published in 4 editions 1810-13-17-21

Dr. Taylor

NATIONAL LIBRARY OF MEDICINE

Washington

Founded 1836

U. S. Department of Health, Education, and Welfare

Public Health Service

DISTRICT CLERK'S OFFICE.

DISTRICT OF MASSACHUSETTS, TO WIT:

BE it remembered, That on the thirtieth day of April, A. D. 1813, and in the thirty-seventh year of the Independence of the United States of America, THOMAS B. WAIT AND CO. of the said district, have deposited in this office the title of a book, the right whereof they claim as proprietors, in the words following, to wit:

"The American New Dispensatory. Containing general principles of pharmaceutic chemistry. Chemical analysis of the articles of materia medica. Pharmaceutic operations. Materia medica, including several new and valuable articles, the production of the United States. Preparations and compositions. With an appendix, containing an account of mineral waters. Medical prescriptions. The nature and medical uses of the gases. Medical electricity. Galvanism. An abridgment of Dr. Currie's reports on the use of water. The cultivation of the poppy plant, and the method of preparing opium. And several useful tables. The whole compiled from the most approved authors, both European and American. By James Thacher, M. D. Fellow of the American Academy of Arts and Sciences, and of the Massachusetts Medical Society, and honorary member of the Georgia Medical Society. Second edition."

In conformity to the act of the Congress of the United States, intitled, "An Act for the Encouragement of Learning, by securing the Copies of Maps, Charts, and Books, to the Authors and Proprietors of such copies, during the times therein mentioned;" and also to an act intitled, "An act supplementary to an act, intitled, an act for the encouragement of learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies during the times therein mentioned; and extending the benefits thereof to the Arts of Designing, Engraving, and Etching Historical, and other Prints."

WILLIAM S. SHAW,

Clerk of the District of Massachusetts.

LAWRENCE OCT 4 1957

RECOMMENDATION.

REPORT OF A COMMITTEE OF THE MASSACHUSETTS MEDICAL SOCIETY.

THE Committee appointed by the Massachusetts Medical Society, to examine a manuscript submitted to their inspection by Doctor James Thacher, under the title of the American New Dispensatory, have performed that service as minutely as their various avocations would admit; and are of opinion, that a work of this kind is much wanted at the present period, on account of the improvements and important discoveries, which have been made in chemical science within a few years, by which the existing publications have been in some measure superseded.

Dr. Thacher appears to have made his compilation from the most approved modern publications, and to have adapted it to the purpose of "a standard work, exhibiting, in familiar language, and a concentrated form, the principles of modern pharmacy, chemistry, and materia medica."

Many of the ancient pharmaceutical articles and preparations, which experience has proved to possess little or no value, have been left out of the work, by which means it is compressed into a smaller compass, and rendered less expensive than most European publications of the same kind.

A number of indigenous substances are introduced into the Materia Medica, which have been hitherto unknown, or which, though their properties are in some instances highly active, have never been brought into general use.

As it appears to have been a principal object of Dr. Thacher to adapt the work to American practice; and, as he has adopted for the basis of his work the Pharmacopœia of Massachusetts, lately published by the Medical Society, and recommended for general use, they are of opinion, that it will co-operate with the views of the Society in that publication, especially as "its nomenclature and order of arrangement seem to be strictly observed" in the manuscript.

They therefore conclude, that it will be for the interest of medical science in this country, to encourage the work, and that it may be the means of exciting a more general attention to the medicinal virtues of American productions, many of which might be introduced into the Materia Medica, and advantageously, as well as economically, supply the place of foreign articles.

JOHN WARREN.
AARON DEXTER.
JOSIAH BARTLETT.

Boston, October 14, 1809.

TO

JOHN WARREN, M. D.

PROFESSOR OF ANATOMY AND SURGERY IN THE UNIVERSITY OF CAMBRIDGE, AND PRESIDENT OF THE MASSACHUSETTS MEDICAL SOCIETY.

SIR,

WERE any apology necessary for the liberty I have taken, of inscribing to you the following sheets, without previously soliciting your assent, it might be found in the various relative circumstances, which designate you as the most proper patron of the work. You have been eminently instrumental in the establishment and advancement of the philanthropic institutions over which you preside; while the applause of the public bears ample attestations to your pre-eminent attainments in medical science, and numerous qualifications as a distinguished teacher of medicine. But, if permitted to indulge, on this occasion, considerations of a more personal nature, I might recur to that interesting period, when officiating in a military hospital, I experienced from your beneficence civilities and acts of friendship very propitious at the time; and which, with more recent instances of friendly intercourse, I shall ever recollect with the most pleasing emotions. Permit me, therefore, to proffer this dedication, as a tribute of respect and gratitude, accompanied with my fervent wishes, that you may long continue to exhibit to the public and to your friends those virtues and that benignity, which are conspicuous traits in your character.

It has become one of the felicities of your day to have associated with you as coadjutor a son, whose talents and intelligence have already attracted public attention, and whose prosperity is peculiarly interesting to yourself.* May this important union, so auspicious to the medical character of our country, with your excellent example and influence, excite emulation in the field of science, and prove a shield to the community against the baneful effects of medical demerit and empiricism.

I am, sir, with sentiments of profound consideration,

Your most obedient servant,

JAMES THACHER.

PLYMOUTH, January 1, 1810.

* John C. Warren, M. D. recently elected adjunct Professor of Anatomy and Surgery.

PREFACE TO THE FIRST EDITION.

Such has been the series of improvements in Chemical Science for the last thirty years, that Dispensatories and Pharmacopœias have in constant succession been superseded and rendered obsolete. Those gentlemen, therefore, whose education is not of modern date, are subjected to the alternative, either of making continual accessions to their libraries, or of treating with disrespect the prevailing systems of the day. Medical students seldom have leisure to search the pages of numerous volumes on the subject; and there is much reason to apprehend, that candidates frequently commence their professional duties under circumstances extremely inauspicious as respects this branch of education. The mutual duties, therefore, both of the medical instructer and the student, might be facilitated by a standard work, exhibiting in familiar language, and in a concentrated form, the principles of modern Pharmacy, as well as those of Chemistry and Materia Medica, to which it is so closely allied.

European Dispensatories, it will be conceded, are not well suited to the views and purposes of American physicians: they still contain in their catalogues many antiquated substances and Pharmaceutical preparations, whose medicinal powers are found by experience to be too trivial to entitle them to consideration; while some valuable remedies employed in this country have not been introduced. The Epitome of Chemistry, and a variety of tables, plates, &c. with the Pharmaceutic apparatus, occupying nearly one hundred and fifty pages in Dr. Dun-

can's Dispensatory, are altogether omitted in this work; and the more concise and perhaps no less judicious "General Principles of Pharmaceutic Chemistry" of Mr. Murray, are substituted. Under the head of Preparations and Compositions, the analogous officinals of the three British Pharmacopœias, are inserted in his Dispensatory; and in some instances the different processes of each are particularly described. These, although of utility in a scientific view, are not to be considered as indispensable to American practitioners in general: nor do they comport with the plan here prescribed.

The Pharmacopœia of the Massachusetts Medical Society, it will be confessed, is not inferior in point of merit to any other. It contains an ample and judicious selection of medicinal substances and preparations; but, being intended merely as a standard of uniformity, the natural history, chemical properties, and medicinal virtues of natural and artificial substances, and their application as remedies, not being appropriate subjects, were inadmissible in such a work. Indeed, since the appearance of that production, the expediency of a concise compilation adapted to our own practical use, has become more evident; and from the desire of co-operating with the views of the Massachusetts Medical Society, their Pharmacopœia is adopted as the basis of this work, and its nomenclature and order of arrangement are strictly followed throughout.

It is, however, to be considered in the character of a compilation only; and when other than the language of the original is substituted, it is with the view of condensing the subject. The general principles of Pharmaceutic Chemistry, general analysis of the articles of Materia Medica and classification of Medicine, taken from Murray's Elements, will be found to enrich the first part of this volume. With respect to the natural history, chemical composition, and properties of medicinal substances, both Duncan and Murray, together with the

American Dispensatory by Dr. Cox, have been carefully consulted, and the same respectable and well established authorities have been the sources resorted to for information relative to officinal preparations and compositions.

The munificence of Providence is so amply displayed in our country, that it may not be deemed too enthusiastic to anticipate the happy period, when by the associated labours of medical men, our Materia Medica shall be copiously furnished from the three kingdoms of nature, with such materials, as will derive additional value from the consideration of their domestic origin, and the facility with which they may be procured. Several indigenous substances, not to be found in any other Dispensatory, have, on this occasion, received proper attention, and their respective characters delineated under all the advantages which the most unexceptionable sources of information could afford. Professor Barton, whose authority is held in universal respect, furnishes in his valuable collection for a Materia Medica of the United States, the requisite information relative to most of these productions. On some occasions the compiler has had recourse to that excellent publication, the Domestic Encyclopedia, edited by Dr. Mease, and also the communications to be found in the several volumes of the Medical Repository of New York.

In other instances, where important information respecting medicinal substances has been announced by American physicians, or otherwise found floating on the surface of science, he has not failed to collect, and incorporate into the general mass.

To the Rev. Dr. Cutler acknowledgments are due for his botanical account of indigenous vegetables,* in which are described some productions that have hitherto escaped the investigation of other writers; and we are induced to hope, that, from the more extended researches of this

* Vid. Memoirs of the American Academy of Arts and Sciences, vol. I.

respectable botanist, the public will derive advantages still more considerable.

Although the appendix augments the size and price of the volume, its contents will be found to afford the reader ample compensation. Indeed, the advantages derived from access to public and private libraries, and an extensive correspondence, have been accompanied with a diligent and zealous application to the subject, and a constant endeavour to compress in this volume an unusual mass of well authenticated medical facts, embracing objects of solid and practical utility.

PLYMOUTH, Mass. January 1, 1810.

PREFACE TO THE SECOND EDITION.

When the American New Dispensatory was first presented to the public, it was contemplated as an essay to ascertain how far such undertaking would be received and encouraged by the learned faculty of the United States, among whom, the character of the compiler was unknown. He is unable to express the grateful emotions excited by the unexpected honour and patronage which have already been bestowed on the work; the whole number of one thousand copies having been disposed of in about two years. The flattering accounts relative to the employment, as remedies, of many of our indigenous vegetables, first introduced in that Dispensatory, enhances the source of satisfaction, and increases his solicitude to render the work still more deserving of public auspices and confidence.

The second edition, now offered, if not enriched with all the improvements of which the original is susceptible, will nevertheless be found to contain numerous additional articles of acknowledged virtues, some of which have not been introduced into any preceding Dispensatory. A large proportion of every Materia Medica is derived from the vegetable kingdom, and the wise Author of Nature, who clothes the earth with rich productions, has probably furnished every climate with the most appropriate remedies for its own peculiar diseases; and in no country, perhaps, has the Divine hand been more bountiful than in our own. Foreign drugs are not at all times to be procured, are always expensive, and not unfrequently

sophisticated, and some of them less efficacious than remedies derived from our own soil.

Some may be surprised that so few of our productions have been incorporated into medical catalogues; but this is not to be expected until, by botanical research and inquiry, we attain a more perfect knowledge of their virtues and properties. Of all the branches of our profession, medical botany and Materia Medica have been the least cultivated and made the slowest progress among men of science in New England. Few subjects, therefore, can, at the present period, excite greater interest than a systematic investigation of the medical character and properties of our native productions, and assigning them their respective rank in the Materia Medica. Every thing invites and constrains to explore the recesses of the mountains and fields; for the earth is replete with riches. Let the cultivating hand of science be extended to bring into view the hidden treasures which have so long remained unenjoyed. If the native Indians possessed a knowledge of practical botany and formed a Materia Medica of sufficient powers to fulfil their medical purposes, what may not be expected to result when theoretical and practical botany shall be combined with accurate experiments and observations under all the advantages of modern improvements?

A correct botanical arrangement of our medicinal vegetables, distinguishing the several species of foreign plants from those that are peculiarly American, would be of the greatest utility, as the means of obviating that confusion and embarrassment so frequently experienced from the application of English names to American plants. This presents an extensive and very profitable field, inviting young candidates for medical degrees to exercise their talents and display their taste and ingenuity. The subject is inexhaustible, and every judicious theme appertaining to it will be viewed as an important acquisition, honorary to the author, facilitating his own

improvement, and contributing to the great object of fabricating an American Materia Medica.

In arranging the botanical part of this improved edition, it was not conceived essential to specify the particular class and order; but merely to detail the distinctive character of plants in language that will enable the attentive observer to recognise them in the herbarium, or while waving in their native state in the field.

For the convenience of the young student and botanist, a glossary of botanical terms employed, will be found in the appendix of the work. Among the new subjects introduced, *oxide of bismuth*, in gastrodynia and pyrosis; *veratrum album*, as the basis of the *Eau medicinale d'Husson*, so celebrated in gout and rheumatism; are of themselves sufficiently important and valuable to inspire the most zealous interest and attention. The new remedy for consumption and other diseases of the lungs, the *Alcornorque* of South America, is noticed so far as our limited knowledge of its character will permit.

The department of preparations and compositions, seemed to require little or no addition, it has therefore received only a few formulæ from Dr. Powel's late translation of the London Pharmacopœia.

The subject of mineral waters, the analysis of those of Balston and Stafford, together with an account of artificial mineral waters, which occupy a few pages in the appendix, are of such obvious utility, that a Dispensatory would, at the present day, be considered as greatly incomplete if these were excluded.

Upon the whole, every practicable endeavour has been exerted with the hope of bestowing on the various subjects connected with this work, that investigation and inquiry which their great importance demand, and of deriving correct information from every source which is supposed to claim public confidence and respect.

Plymouth, January 1, 1813.

TABLE OF CONTENTS.

Page

INTRODUCTION xxi

PART I.

General principles of Pharmaceutic Chemistry 25
SECT. I. Chemical Analysis of the articles of the Materia Medica 25
SECT. II. Pharmaceutic operations 78

PART II.

MATERIA MEDICA.

Classification of Medicines, and a view of the operation of Medicine on the living system 97
CLASS I. Narcotics 97
II. Antispasmodics 100
III. Tonics 101
IV. Astringents 103

LOCAL STIMULANTS.

V. Emetics 105
VI. Cathartics 108
VII. Emmenagogues 112
VIII. Diuretics 113
IX. Diaphoretics 114
X. Expectorants 116
XI. Sialagogues 117
XII. Errhines 118
XIII. Epispatics and rubefacients 118

REMEDIES ACTING CHEMICALLY.

		Page
XIV.	Refrigerants	120
XV.	Antacids	121
XVI.	Lithontriptics	122
XVII.	Escharotics	122

REMEDIES ACTING MECHANICALLY.

XVIII.	Anthelmintics	123
XIX.	Demulcents	123
XX.	Diluents	124
XXI.	Emollients	124

PART III.

PRAPARATIONS AND COMPOSITIONS.

Chap. I.	Sulphur	381
II.	Acids, alkalis, earths, and their compounds	382
III.	Metalline preparations	421
IV.	Ether and etherial spirits	459
V.	Expressed and inspissated juices	464
VI.	Fixed oils and oily preparations	468
VII.	Distilled waters and spirits	471
VIII.	Volatile oils	475
IX.	Infusions and decoctions	480
X.	Emulsions and mucilages	488
XI.	Syrups	491
XII.	Medicated vinegars	496
XIII.	Tinctures	498
XIV.	Medicated wines	519
XV.	Extracts	524
XVI.	Powders	527
XVII.	Conserves and electuaries	532
XVIII.	Troches	535
XIX.	Pills	537
XX.	Cataplasms	545
XXI.	Liniments, ointments, cerates and plasters	548

APPENDIX.

No. I. Of mineral waters 565
II. Medical prescriptions 575
III. On the nature and medicinal uses of the gases 578
IV. Medical electricity 587
V. Galvanism 592
VI. An abridgment of Dr. Currie's medical reports on the use of water 595
Cold and warm bathing 640
VIII. Method of cultivating American opium . . 647

TABLES.

Table of synonymes of the medicines, simple and compound, in the pharmacopœias of London, Dublin, and Edinburgh 652
Table, shewing the proportion of antimony, opium, and quicksilver, contained in some compound medicines 687

A Glossary of botanical terms 689

English Index 695
Latin index 721

TULIP, OR POPLAR TREE.

[The author is indebted to Dr. S. Drown, for the following useful information respecting the tulip or poplar tree, which he deems important and necessary to be communicated to the public, although received too late to be inserted in the proper place.—See page 257.]

LIRIODENDRON TULIPIFERA. *Tulip, or Poplar Tree.*

"The Liriodendron tulipifera, tulip or poplar tree grows throughout the United States of North America. The best time to procure the bark for medicinal purposes, is in the month of February; as the sap at this time, being more confined to the root increases its virtue. It possesses the qualities of an aromatic, a bitter, and an astringent; the bitter quality is greater, the astringent less than in the Peruvian bark. It likewise possesses an aromatic acrimony; hence I infer, it is highly antiseptic and powerfully tonic. I have prescribed the poplar bark in a variety of cases of the intermittent fever; and can declare from experience, it is equally efficacious with the Peruvian bark, if properly administered. In the phthisis pulmonalis, attended with hectic fever, night sweats, and diarrhœa, when combined with laudanum, it has frequently abated these alarming and troublesome symptoms. I effectually cured a Mr. Kiser, fifty years of age, who was afflicted with a catarrh and dyspeptic symptoms for five years, which baffled the attempts of many physicians, and the most celebrated remedies, by persevering in the use of the poplar bark for two weeks.

I can assert from experience there is not in all the Materia Medica, a more certain, speedy and effectual remedy in the hysteria, than the poplar bark combined with a small quantity of laudanum. I have used no remedy in the cholera infantum but the poplar, after cleansing the primæ viæ, for these two years. It appears to be an excellent vermifuge. I have never known it fail in a single case of worms which has come under my observation. I prescribed it to a child when convulsions had taken place. After taking a few doses, several hundreds of dead asca-

rides were discharged with the stools. The dose of the powder to an adult, is from a scruple to two drachms, it may likewise be used in tincture, infusion, or decoction; but its virtues are always greatest when given in substance."

The foregoing is part of a letter addressed to Governor Clayton of Delaware in 1792, by Dr. J. T. Young, of Philadelphia. (American Museum, Vol. 12.) In his reply, the Governor observes, "During the late war the Peruvian bark was very scarce and dear. I was at that time engaged in considerable practice, and was under the necessity of seeking a substitute for the Peruvian bark. I conceived that the poplar had more aromatic and bitter than the Peruvian, and less astringency. To correct and amend those qualities I added to it nearly an equal quantity of the bark of the root of *dogwood* (cornus florida or boxwood) and half the quantity of the inside bark of the white oak tree. This remedy I prescribed for several years, in every case in which I conceived the Peruvian bark necessary or proper with at least equal if not superior success. I used it in every species of intermittent, gangrenes, mortifications, and in short in every case of debility. It remains to determine whether the additions of those barks to the poplar increases its virtues or not; this can only be done by accurate experiments in practice."

A further account of the analysis and virtues of this medicine is given by Professor Rush in the transactions of the College of physicians of Philadelphia and in a paper published in one of the volumes of Tilloch's Phil. Magazine.

Eupatorium Perfoliatum. [See p. 217 of this work.]

After the printing of this work was completed, an inaugural dissertation on the *Eupatorium perfoliatum* by Dr. Andrew Anderson, of New York, was politely communicated. The production evinces ingenuity and ability, and its contents are interesting and important. His investigation is judicious, and experiments executed in a manner highly creditable to the character of the author. He designates the species in the following botanical terms:

E. Perfoliatum. *Lin.*

E. Virginianum. *Morris Hist.*

E. Virginianum. *Pluk. Alm.*

E. Connatum. *Mich. Flor. Bor. Amer.* He then proceeds to enumerate the various trivial names by which the plant has long been familiarly known throughout the United States, such as thoroughwort, indian-sage, crosswort, bone-set, vegetable antimony, &c. The chemical properties of this plant the author has ascertained by accurate analysis, and its medicinal virtues by practical experiment. According to his chemical experiments it seems to be satisfactorily proved, that the E. Perfoliatum contains firstly a free acid; secondly, tannin; thirdly, extractive matter; fourthly, a gummy matter; fifthly, a resin; sixthly, azote; seventhly, lime, probably the acetate of lime; eighthly, gallic acid, probably modified; ninthly, a resiniform matter, soluble in water and in alcohol, and which seems to contain a bitter principle. Hence he deems it warrantable to conclude that this plant possesses active medicinal properties; that many of them are similar to those which characterize the cinchona officinalis, the anthemis nobilis, and other valuable articles of the materia medica; but that these virtues reside in greatest quantity in the *leaves*.

As pharmaceutical preparations of this plant the author recommends the decoction of the flowers and of the leaves; infusions of the same parts; the leaves in substance pulverized; and a tincture of the flowers and of the leaves, prepared with proof spirits. This last form

is the most pleasant and convenient, and at the same time the most powerful, for proof spirits was ascertained to be the best menstruum. Our author does not hesitate to assert that the chemical properties of E. Perfoliatum as deduced from experiment are in very many respects exactly similar to the peruvian bark; and that for its active medicinal virtues, particularly as a sudorific and as a tonic, it will not suffer by comparison with any of the articles drawn from the vegetable kingdom. In addition to his own opportunities of witnessing the employment of this plant, in different diseases in the New York Almshouse, he appeals to the observations and experience of several distinguished practitioners, particularly of Dr. Barton and of Dr. Hosack for the importance and efficacy of this remedy in the treatment of most febrile disorders, particularly in intermitting and remitting fevers, yellow fever, and in other disorders of specific contagion; in many cutaneous affections, and in diseases of general debility. It may however be observed, that if it be exhibited as a warm decoction, it often proves emetic, and acts especially upon the skin, in producing diaphoresis: if in the form of cold infusion or decoction, or in substance, it acts as a powerful tonic. Dr. Anderson proceeds to detail six cases of intermittent fever in which after a single evacuant the thoroughwort effected radical cures, and adds that the same remedy was administered in almost all the instances of intermittents that occurred in the New York alms-house in the year 1812 to the exclusion of the Peruvian bark, and with uniform success. It was given either in decoction, or in powder from 20 to 30 grains every second hour during the intermission. In remitting fever, as a sudorific it produced the most salutary effects, and in those cases where tonics were indicated it proved no less advantageous. In the treatment of yellow fever he adduces the high authority of Dr. Hosack and Dr. Bard, who after proper evacuations placed almost exclusive dependence on sudorifics, and among this class of medicines the eupatorium administered in the form of decoction was deservedly considered of great value. The disease called by some the *petechial* or *spotted fever*, and by others the *malignant pleurisy* or *typhoid peripneumony* has been more successfully treated by the class of remedies denominated sudorifics than by any other, and in many cases of this epidemic which

occurred in the city of New York in the winter of 1812–13 after the proper evacuations had been employed, the eupatorium was resorted to, and its sudorific, its tonic and its cordial properties were clearly demonstrated, and much benefit was derived from its use. In some obstinate cutaneous diseases according to Dr. Barton eupatorium has produced very beneficial effects. During the author's attendance in the New York alms-house in the year 1812 very liberal recourse was had to this remedy in diseases arising from general debility. In anasarcous affections of the extremities, and in ascites when it may be considered as a disease of debility, the alcoholic tincture of eupatorium may be safely recommended as an excellent tonic; and in addition to its tonic effects, the properties of a diuretic render the employment of it still more advantageous in cases of this description.

INTRODUCTION.

MATERIA MEDICA, understood according to the strict definition of the term, is that department of the science of medicine which relates to the knowledge of remedies, or of the effects produced in the human system by such substances as are employed for the removal of disease. The OBJECTS to be attended to in its study are the natural history, the chemical composition and properties, and the medicinal powers and applications of the substances which belong to it.

The NATURAL HISTORY of these substances is of utility in furnishing appropriate characters by which they may be distinguished. Many of them bear a close resemblance to each other, and can only be discriminated by those minute and accurate distinctions which the methods of natural history afford.

From the intimate connection which frequently subsists between those properties on which natural classification is established, and the various qualities with which bodies are endowed, natural history is likewise, to a certain extent, capable of affording indications of the virtues of remedies. Thus, in the vegetable kingdom, the different species of the same genus, and even the different genera of the same natural order, are composed of substances which frequently exert the same actions on the living system; yet to this connection there are exceptions so numerous and important, that it is incapable of just application to any considerable extent; it can only suggest conjectures, which require to be brought to the test of experiment.

The more full description of the sensible properties of the articles of the materia medica, affords the most obvious method of distinguishing them, and in many cases the easiest and most certain criterion of their purity and perfection.

It has likewise been imagined, that the sensible qualities of medicines afford indications of their peculiar powers. Those, for example, which are inodorous and insipid, are seldom active remedies; and those which have a similarity in taste or in flavour, have also a general resemblance in their virtues. But though indications of this kind may be partially true, they are extremely limited in their application, and are liable to many causes of obscurity and error.

The CHEMICAL HISTORY of the articles of the materia medica, embraces several important subjects of inquiry.

Their analysis, especially that of those belonging to the vegetable kingdom, has been supposed capable of leading to a knowledge of their virtues; and the opinion does not *a priori* appear improbable, since the medicinal powers of any compound body, in common with its other internal properties, must arise from its peculiar composition. Without any reference, however, to the very imperfect analyses of the older chemists, it may be remarked, that even from the researches of modern chemistry little information of this kind can be acquired. It may be discovered, indeed, in what proximate principle of any vegetable substance its virtues reside; but this affords no previous indication of these virtues. Nor can the analysis of these principles explain the source of the powers which are attached to them in particular substances; the peculiarities of composition from which these may originate, being by far too subtile to be detected by chemical means.

Chemistry, however, is in other respects more directly useful in its application to the materia medica. It enables us, by the use of proper solvents, or by the due appli-

cation of heat to separate those proximate principles of vegetables in which their virtues reside, from other inert or noxious matter with which they may be mixed; it ascertains how far these processes are useful, points out those changes in composition by which the virtues of the substances acted on are frequently altered, and the means by which such injuries may be lessened or prevented. Similar advantages are obtained from its application to the few products of the animal kingdom that are used in medicine. Those which are derived from the mineral kingdom, can be employed with advantage and discrimination only when their composition is known; and the analyses of these substances have exploded many errors respecting them, have enabled us to distinguish them from each other, have pointed out the identity of others, and have rectified the processes by which they are prepared.

By new combinations, chemistry furnishes us with many remedies equally active and important with those afforded by nature; and by pointing out the mutual chemical action of different substances, it guards against the errors which might arise from improper mixtures.

THE

AMERICAN NEW DISPENSATORY.

PART I.

OF THE GENERAL PRINCIPLES OF PHARMACEUTIC CHEMISTRY.

Pharmaceutic Chemistry is that branch of chemical science which investigates the composition of bodies, and considers their mutual chemical relations, so far as these are connected with their medicinal properties and applications. It connects the doctrines of Materia Medica and Pharmacy, and forms a proper introduction to the study of each; an exposition of its principles being necessary in delivering the history of the articles of the Materia Medica, and being not less indispensable in explaining the operations of Pharmacy. It includes two subjects, *first*, the analysis of bodies, so far as relates to the enumeration of their constituent principles; and *secondly*, the general operations to which they are subjected in their preparation as remedies.

SECTION I.

Of the Chemical Analysis of the articles of the Materia Medica.

The ultimate object of chemical investigations is to discover the composition of bodies; and the result of these investigations is the reducing them into two classes, those which are simple and those which are compound. The

former are such as consist of parts perfectly alike; the most minute particles into which a simple body can be resolved, retaining all its essential properties, and being similar to each other. Compound substances can, on the contrary, be resolved into parts different in their qualities from each other, and from the compound which they had formed.

It is from the union of simple substances that compounds are produced. When two simple bodies are placed in contact, under certain circumstances, an attraction is often exerted by the particles of the one to those of the other: they unite and form a compound, having peculiar properties. These compounds are farther capable of combining with other simple bodies, or with each other, which gives rise to a series of bodies still more extensive; and these again are capable of new combinations, or of such intimate mixtures with each other, as to form many peculiar substances. There are thus produced, from a few simple substances, all the products of nature, and all those which are the results of the operations of art.

It is the province of chemistry to trace these combinations; to determine whether bodies are simple or compound, and, if compound, to ascertain the number of their constituent principles, the proportions, and the modes in which they are combined.

The general process by which these objects are attained, is termed, in the language of chemistry, analysis. It is merely the separation of a compound body into its constituent parts, and is effected either by the agency of heat, or by the exertion of a superior attraction.

The analysis from the application of heat, differs according to the composition of the body analyzed. If a compound, consisting of two simple substances, be exposed to heat, it in many cases happens that the mutual attraction by which its principles were united ceases, and a decomposition or separation of these principles takes place. This is an example of pure analysis; no change being produced, but merely the separation of the component parts of the compound, so that each is obtained in its original state.

An analysis more complicated is that where several substances are combined together, in such a manner that their attractions are reciprocally balanced, and one compound is formed. When a compound of this kind is

exposed to a high temperature, this balance is frequently subverted, and the compound is decomposed. But its constituent principles, instead of passing off pure, enter into new combinations with each other, and form other compounds, each of which may be collected, and in its turn analyzed. It is in this manner that vegetable and animal substances are acted on by heat: the products afforded by their analysis are not such as pre-existed in them, but are compounds formed during the decomposition, from new combinations of their ultimate constituent principles. This is what is named false or complicated analysis.

Chemical analysis is also effected by the exertion of a superior attraction. If a compound be placed successively with different substances in situations favourable to the operation of chemical action, one or other of these substances may exert a superior attraction to one or other of its component parts; a decomposition will be produced, and from the products the constituent principles of the compound as well as their proportions may be determined. As compound substances can combine together so as to form a new compound, it is obvious, that this compound may be resolved either into the immediate principles from the union of which it has been formed, or into those of which these consist. It is necessary, therefore, that these should be distinguished. The former are accordingly named the proximate principles of a compound; the latter the ultimate principles. The proximate principles are of course compounds; the ultimate principles are the elements of these compounds; and the results of analysis are extremely different, according as one or other of these is obtained. When by analysis the constituent principles of a body have been obtained, they may often be combined again, so as to reproduce the substance analyzed. This operation is named Chemical Synthesis; and when it can be effected, is the surest proof of the accuracy of the analysis.

In analyzing the various products of nature, we arrive ultimately at substances which we are unable to decompose, and which are therefore regarded as simple. The absolute simplicity of these is not indeed established; for our inability to decompose them may not arise from this, but from the imperfections of our modes of analysis; and it is even probable, that all the substances

which are yet known to us may be compounds, and that a more refined chemistry may discover their composition. Until this be accomplished, however, they are regarded as simple, and they are so with regard at least to our knowledge of them. As the ultimate principles, therefore, of all analysis, they are first to be considered in proceeding to the general analysis of the articles of the Materia Medica.

Of these bodies, oxygen is the most important. There is no simple substance which exerts an attraction to so many others, or which gives rise to such important compounds. With a few exceptions, indeed, all the productions of nature are either capable of combining, or are already combined with this principle; and the development of its agencies constitutes the most extensive and important part of chemical science.

Oxygen always exists in the gaseous state: when it enters indeed into combination with other substances, it often becomes concrete; but its properties are at the same time changed, and its descriptive characters are therefore taken from it as it exists in the aerial form. Like other gases it is invisible and elastic; its specific gravity is rather greater than that of atmospheric air; it is absorbed by water, but in a very small proportion.

The distinguishing properties of oxygen gas are those of supporting respiration and combustion. An animal lives much longer in this air than it does in any other; and combustion in it is more vivid and durable. It is the only air indeed, which, strictly speaking, can support either of these processes; other aeriform fluids doing so only from the oxygen they contain.

Its capacity of supporting combustion is more particularly to be assumed as its characteristic chemical property; combustion being nothing but the combination of oxygen with combustible bodies, accompanied with the emission of heat and light. It also frequently, however, enters into combination without the phenomena of combustion being apparent, more especially when the absorption of it takes place slowly, or when it is transferred from a compound in which it exists to another substance. The combination of a body with oxygen is termed oxygenation, or oxidation. The products of this combination have either certain common properties, belonging to a class of chemical agents long distinguished by the ap-

pellation of acids; or they are destitute of these properties, and they are then denominated oxides.

Oxygen forms one-fourth part of atmospheric air; and it is principally on its agency that the many chemical changes produced in bodies by that air depend.

Combined with another elastic fluid, hydrogen, in the proportion of 85 parts to 15, it forms water, the substance which has the most extensive operation in promoting chemical action by the fluidity it communicates, and which more directly produces many important chemical changes, by affording oxygen to bodies. This element exists as a constituent principle of all acids, and communicates to them their energy of action. It has more lately been established, that it is also an ingredient in the composition of the alkalis and earths, and that it is therefore the principle of alkalinity as well as of acidity.* With all the metals it combines in different proportions, communicating to them a greater susceptibility of chemical action, and greater activity in their relation to the living system; and it exists as a constituent part of nearly all the vegetable and animal products. Hence no principle is more extensively diffused, and none has a more marked influence in the combinations into which it enters.

The elastic fluid which, along with oxygen gas, composes atmospheric air, is named azote or nitrogen. Its chemical agency is less powerful, nor does it possess any very remarkable property by which it can be characterized; hence it is distinguished rather by negative qualities. It is lighter than oxygen gas, is incapable of supporting combustion or respiration, is scarcely sensibly absorbed by water, and is not combustible in the strict sense of the term, for although it combines with oxygen, the combination is not rapid; it does not, after it has commenced, proceed of itself, and it is not attended with any sensible emission of heat or light.

Nitrogen gas forms three-fourths of atmospheric air, the remaining fourth part being oxygen gas. In more

* "According to this view of the subject, oxygen, like the traveller in the fable, is capable of blowing hot and cold with the same breath! This extraordinary agent is, we see, the principle of acidity as well as of alkalescence! Surely we may be allowed to doubt the possibility of two such opposite effects resulting from one and the same cause."

Coxe's note on alkali. Edin. Ency. Amer. edition.

intimate combination with oxygen, and in that proportion in which they are mutually saturated, it forms a very powerful acid, the nitric acid; and in lower degrees of oxygenation it forms compound gases which have no acid powers. With hydrogen, and probably a portion of oxygen, it forms ammonia, one of the alkalis: it exists in some vegetable substances, and is a constituent principle of nearly all the varieties of animal matter. This substance had been usually regarded as simple. The recent researches which have arisen from the application of galvanic electricity to chemistry, have established some singular facts with regard to it; whence the conjecture has been formed that it is a compound, and, in particular, that it is connected in chemical constitution with hydrogen: but the subject is still involved in such obscurity as to preclude any certain conclusion.

Atmospheric air, of which oxygen and nitrogen are the essential constituent parts, has merely the aggregate properties of these two gases, their combination being so slight that no new powers are acquired from it; and, as the oxygen is the more energetic ingredient, the chemical agencies of this air depend chiefly on the operation of this principle. It yields oxygen to a number of substances, with more or less rapidity, and thus changes their chemical constitution. It sometimes acts too by communicating humidity; and in a few cases, by affording an elastic fluid, carbonic acid gas, which is diffused through it in small proportion. Its nitrogen exerts no active power, but apparently serves merely to dilute, and thus to moderate the action of the oxygen gas.

Hydrogen is another elastic fluid, which in the system of modern chemistry has been regarded as elementary, and the importance of which, as a principle opposed to oxygen in its chemical powers, recent discoveries appear to establish. In its aerial form, in which form only it can be obtained uncombined, it is the lightest of all the elastic fluids, and the lightest substance therefore whose gravity we can ascertain. It is distinguished farther by its high inflammability; it burns whenever an ignited body is approached to it in contact with atmospheric air, and explodes if previously mixed with the air. The product of its combustion is water, which is therefore considered as a compound of it with oxygen. Combined with nitrogen, it forms ammonia: with the primary

inflammables, sulphur, carbon, and phosphorus, it forms compound gases: it dissolves even some of the metals, and it is an abundant ingredient in vegetable and animal substances.

Water, of which hydrogen is the base is a substance extremely peculiar in its chemical relations. Its power of combination is extensive, there being few substances on which it does not act, or with which it does not combine; yet in these combinations no energetic action is displayed; it in general scarcely produces any alteration of properties; and hence its most important operation is the communicating that state of fluidity to bodies which is in general necessary to their mutual chemical actions. It is more peculiarly the solvent of all saline substances, and of the greater number of the earths; and it dissolves many of the vegetable and animal products. When it communicates oxygen, it produces more important changes. Several of the metals are slowly oxidated by it; and when they are dissolved by acids, it often acts by affording to them that oxygen which is necessary to the solution. Vegetable and animal substances often suffer chemical changes from the oxygen which water imparts, as well as from the fluidity it communicates favouring the re-action of their constituent parts; and in their decomposition at elevated temperatures, the elements of the water they contain enter into the composition of the products which these decompositions afford.

There are three substances formerly supposed to be simple, distinguished by the property of inflammability, and hence named simple inflammables, which exist as constituent principles of a number of natural products. These are carbon, sulphur, and phosphorus. Recent discoveries appear to favour the conclusion, that the inflammable matter of each of them has not yet been obtained perfectly pure; but that in the state in which they are presented to us, it is combined with a small portion of oxygen, and perhaps of hydrogen; and some analogies even lead to the conjecture, that the ultimate bases are metallic. In this compound state, however, they are destitute of the metallic splendour, opacity, and specific gravity, and are connected chiefly by the common property of inflammability. When united with oxygen, they form acids.

Carbon. The ultimate base to which the name of

carbon ought to be appropriated is probably still unknown to us: but there are several substances of which it constitutes the greater part, and of course in which it exists in a state more or less pure. Wood charcoal in burning is almost entirely consumed, forming with the oxygen with which it combines a peculiar elastic fluid, carbonic acid, and leaving only a small residuum of earthy, saline, and metallic substances. As a discriminating appellation of the pure inflammable matter which thus combines with oxygen, the term carbon was introduced, and it denoted therefore simply this matter free from the other substances mixed with it in charcoal, and apparently not essential to its constitution. It was afterwards discovered, that the diamond, which was known to be a combustible body, affords in burning precisely the same product as charcoal, and hence therefore consists of the same inflammable matter. Different opinions were advanced with regard to the difference between charcoal and diamond; but from galvanic experiments it appears, that in charcoal the inflammable base is combined with a little hydrogen, in diamond with a very minute proportion of oxygen. In the substance named plumbago, it is united with a small quantity of iron; it has not therefore been obtained entirely insulated; but it is to this inflammable base common to all these substances, and composing nearly the whole of their weight, that the term carbon is understood to be appropriated.

Carbon, besides existing as an element in the composition of many mineral substances, is an abundant ingredient in the products of the vegetable and animal systems. Not being volatile, it forms the principal part of the residual mass when these are decomposed by heat; and it is by this decomposition of vegetable matter, especially of the wood of plants, that it is obtained in the form of charcoal. With oxygen, combined in different proportions, it forms two elastic fluids, carbonic oxide, and carbonic acid. With hydrogen and oxygen, in different proportions, it forms various inflammable gases. Alkohol, or pure ardent spirit, which is the product from saccharine matter by fermentation, is a similar compound; and ether, which is formed from alkohol by the action of acids upon it, is of the same composition with a larger proportion of hydrogen. Lastly, this ternary combination of carbon, hydrogen, and oxygen, in various propor-

tions and modes of combination appears to constitute the principal varieties of vegetable matter.

Sulphur is found in nature principally as a constituent part of mineral bodies. It exists combined with many of the metals; and combined with oxygen forming sulphuric acid, it enters into the composition of a number of saline and earthy compounds. It is highly inflammable; in burning it combines with oxygen, principally in that proportion which forms an elastic fluid, highly pungent and suffocating, sulphurous acid. With a larger proportion of oxygen, it forms a dense inodorous liquid acid, sulphuric acid. With hydrogen, it forms an inflammable gas, sulphuretted hydrogen, which exists in nature impregnating water in the sulphurous mineral waters; and this compound, either alone, or with an additional proportion of hydrogen, forming what is named super-sulphuretted hydrogen, enters into combination with alkalis, earths, and metallic oxides, forming several important pharmaceutic preparations. Lastly, sulphur exists as a constituent part of animal substances: hence sulphuretted hydrogen is generally evolved in the decomposition of these by heat or putrefaction: it has also been detected in the composition of a few vegetables. This inflammable substance appears, from galvanic experiments, to consist of a peculiar base, not yet obtained insulated, combined with small proportions of hydrogen and oxygen; and it is probably this base which enters into the preceding combinations.

Phosphorus, like sulphur, is found chiefly as an ingredient of animal matter. Combined with oxygen, in the state of an acid, it also exists in several of the natural compounds of the mineral kingdom. It is of a soft consistence like wax, semi-transparent, and of a white or yellowish colour; it is so highly inflammable that it burns spontaneously when exposed to the air. It combines with two proportions of oxygen, forming two acids, the phosphorus and the phosphoric. With hydrogen it forms a gas highly inflammable; and it unites with sulphur and with the metals. It too contains minute quantities of oxygen and hydrogen, and its simple base is therefore unknown.

The class of *metals* is an extensive one, the substances to which this name is appropriated being numerous, and the number being still farther augmented, if the lately discovered bases of the alkalis and earths are to be re-

garded as metallic.* The physical properties, characteristic of the metals, are opacity, great lustre, density, and tenacity under the two modifications of ductility and malleability. These are possessed in different degrees by the different metals, and if the basis of the alkalis and earths are to be admitted as metals, the property of density cannot be considered as distinctive, as some of these are even lighter than water. With regard to chemical properties, the metals are fusible, in general not volatile except at very intense heats; they are capable of combining with oxygen, with hydrogen, sulphur, carbon, and phosphorus, with each other, and when oxidated are capable of uniting with acids, alkalis, and earths.

Of these combinations, that with oxygen is the most important; and in relation to the object of this outline, the only one requiring any farther observations. This combination is effected in various modes. When heated in contact with the air, they attract its oxygen: if the temperature be very highly elevated, as in that produced in the galvanic circuit, they display during this oxidation the phenomena of combustion; even if the temperature is less elevated, several of them burn more or less rapidly; but the greater number are oxidated more slowly, and without any sensible extrication of light. Several metals are slowly oxidated by water, or by the joint action of air and water at natural temperatures. And all of them can be oxidated by acids, the acid either directly imparting oxygen to the metal, or enabling it to attract this principle from the water which is present.

The compounds of metals with oxygen belong in general to the order of oxides. They are destitute of the physical properties of the metals, and have an earthy like appearance. Two or three metals acquire in their highest state of oxygenation, acid powers.

In combining with oxygen, different metals unite with very different quantities of it. Each of them combines too with different proportions of oxygen, giving rise to the

* "It is probable, that the numerous discoveries of chemistry, will render it necessary to alter entirely the present arrangement of the bodies which are the subjects of chemical investigation. Amongst these changes, since the alkalis and earths are found to be metallic, we shall have to divide the class of metals, into metals properly so called, and into those which are capable of acidification or alkalization."

Coxe's note, article alkalis. Edin. Ency. Amer. edition.

production, from the same metal of oxides having very different properties. These proportions have been supposed to be determinate, but there is every reason to believe that they are not so, except from the operation of external circumstances connected with the oxidation; that the natural tendency of the law regulating these combinations, is to unite the metal with the oxygen, in quantities indefinite, from the *minimum* to the *maximum*, and that uniform and determinate proportions are established in particular cases, only by causes foreign to the reciprocal attraction whence the combination results,—a circumstance of much importance, as is to be afterwards pointed out, with regard to the pharmaceutical processes on the metals.

When the metals are combined with oxygen, they become capable of combining with the acids, and they then acquire greater activity and power of chemical action. This previous oxidation of a metal is always necessary to its combination with an acid, and hence, when acids act on metals, they first impart to them oxygen, or enable them to attract oxygen from the water, or sometimes from the air, and then combine with the oxide that is formed. As the same metal is capable of existing in different states of oxidation, so by combining in these states with the same acid it forms very different compounds; and these compounds are farther diversified by the different proportions of acid combined in them. Metals are rendered active on the living system, principally by being thus combined with oxygen, or farther combined with acids. In their metallic state, they seldom produce any sensible effect; and any effect they do produce appears to arise from their being chemically acted on by the gastric fluids. When oxidated, they become much more active; and still more so when the oxide is combined with an acid. And even the degree of oxygenation considerably influences their powers; so that from the same metal preparations of very different degrees of medicinal activity may be obtained, though all agreeing in the kind of action they exert.

It would be foreign to the object of this sketch to give the description of the individual metals: it is sufficient to have stated with regard to them these general facts. Few of them exist as common ingredients in the composition of natural substances, with the exception of iron.

A class of substances, possessing certain common properties, the ultimate principles of the various compounds, not metallic or inflammable, which occur in the mineral kingdom, had been distinguished by the appellation of *Earths*. An analogy had often been observed to exist between these substances and metallic oxides; and the conjecture had even been advanced, that they are of similar constitution, or consist of metallic bases combined with oxygen. By a train of investigation, originating in very different analogies, the composition of the earths has been established, and their bases discovered to be substances previously unknown, and possessing general properties, so nearly allied to those of metals, as to be sufficient perhaps to justify the placing them in that class; yet still so far different as to afford some reason for regarding them at least as a peculiar order.

The Primary or Simple Earths, as they are named, to distinguish them from the various earthy aggregates which exist in nature, have been described as substances insipid, insoluble in water, fixed, and nearly infusible by heat, uninflammable, and capable of combining with acids, so as to neutralize the acid properties. All these characters are not equally appropriate; for there are several of the earths which have a pungent taste, and are soluble in water to a considerable extent, and all of them may be fused by very intense heats.

The principal earths are Silex, Argil, Magnesia, Lime, Barytes, and Strontites; Zircon, Glucine and Ittria, having more doubtful claims to be ranked in this class, or existing in such minute quantities as to be comparitively unimportant.

Silex is an abundant ingredient, not only in mineral substances, but is frequently contained in vegetable products, and forms part of the earthy residuum of their decomposition. It is tasteless, nearly infusible and insoluble in water, and is peculiarly distinguished by its inertness, and comparatively limited range of combination; among the acids it combines only with the fluoric, and even scarcely neutralizes its properties. It unites with the fixed alkalis, and by fusion with the other earths and the metallic oxides.

Argil is insipid, soft to the touch, infusible, insoluble in water, and particularly distinguished by forming with that fluid a ductile plastic mass, which hardens and con-

tracts considerably when heated. With the acids it forms compounds, which have generally a sweetish styptic taste, and which possess, to a certain extent the property of astringency.

Magnesia exists in the form of a very light white powder, smooth and impalpable; infusible, insoluble in water, and not forming with it a coherent paste; it has a slightly bitter taste, changes the more delicate vegetable blue colours to a green, and combines with acids, forming compounds, in general very soluble, and having a bitter taste. In its pure form it is medicinally employed as an antacid, and its saline compounds have in general a cathartic power.

Lime, or calcareous earth, displays still greater energy of action. It is so far soluble in water, as to communicate to the solution a very harsh styptic taste, and the power of changing the vegetable colours to a green. Being usually obtained by the decomposition of limestone, chalk, or marble, by heat, it is in the form of a hard mass; but when it imbibes water, either directly or from exposure to the atmosphere, it splits, and falls down into a white powder perfectly dry. It is infusible. Combined with the acids, it neutralizes their properties. Its action is considerable on the animal system. Directly applied to animal matter, it acts chemically, producing decomposition, and thus operating as an escharotic. Given in solution, it exerts an astringent and tonic power, which power is also displayed in several of its saline combinations; and by its chemical agency it acts as an antacid, and as has been supposed, likewise as a lithontriptic. Its base has been obtained, though not perhaps perfectly insulated; it has the metallic lustre, and appears to be highly inflammable.

Barytes surpasses lime in energy of chemical action. Like it, when in a solid mass; it absorbs water rapidly, and falls into a dry white powder; its taste is harsh and caustic: when water is combined with it, it fuses by a heat comparatively moderate; but when this is dissipated, the heat requires to be raised to a much higher point. It is more soluble in water than any of the earths, cold water dissolving a twenty-fifth of its weight, and boiling water even more than half its weight; this latter solution depositing, as it cools, transparent prismatic crystals. Its solution changes the vegetable colours to a green.

This earth combines with the acids, and appears to exert to them very powerful attractions, as it decomposes their compounds with the other earths and the alkalis,—a circumstance probably owing, however, rather to the insolubility of the compounds it forms, than to any superior force of attraction. It exerts affinities to the other earths, and combines also with sulphur and phosphorus. Of all the earths, it is the one which acts most powerfully on the living system. Even in small quantities, it occasions unpleasant symptons, and its preparations prove poisonous to animals. From this quality, and from another, the great specific gravity of several of its saline combinations, particularly the native sulphate and carbonate, barytes was often more peculiarly supposed to be of a metallic nature. Its decomposition has been effected by the application of galvanism, and a base obtained from it, of a metallic appearance, having the colour of silver, considerably heavier than water, fusible at a heat below redness, not volatile, inflammable, and reproducing barytes when combined with oxygen.

Strontites, the last of these earths, bears a close resemblance to barytes in many of its properties. Like it, it has a pungent acrid taste, is soluble in water, crystalizable from its saturated solution by cooling, changes the vegetable colours to a green, combines with acids, and decomposes a number of the compounds which they form with the other alkalis and earths. Its native compounds too have a considerable specific gravity. It is, however, much less soluble in water than barytes; it requires nearly 200 parts of cold water to dissolve it, though boiling water dissolves it in much larger quantity. Barytes decomposes its salts. It is not poisonous, nor does it appear to exert any marked action on the living system. A characteristic property of it is that of its salts causing inflammable bodies to burn with a blood red flame.

Following the series from the metallic oxides through the earths, we arrive at the *Alkalis*. These possess the chemical property common to the whole, and most characteristic, that of combining with acids, neutralizing the acid properties, and forming compounds, analogous in general properties to those formed by the earths and metallic oxides with the acids. But they display still more energy in their chemical actions than the earths, and are

more remote in their qualities, from the oxides of the common metals. Their taste is extremely harsh and acrid; they are highly caustic, abundantly soluble in water; exerting indeed such an attraction to it as to imbibe it from the atmosphere, or attract it from other bodies: they are fusible by a moderate heat, and by a stronger heat are volatilized; they change the vegetable blue and purple colours to a green, the yellow to a brown, and they combine with oils, rendering them diffusible or soluble in water. These properties belong to two of the alkalis which are naturally concrete, potash and soda. A third, ammonia, exists when uncombined as a permanent gas, but it is instantly condensed by water, and absorbed by it in large quantity, and the general properties of it not connected with its peculiar form are the same.

One of the most splendid discoveries of modern Chemistry is that of the composition of the alkalis. Ammonia had been known to be formed from the combination of hydrogen with nitrogen, and analogy suggested to chemists the conclusion, that the two fixed alkalis are of similar constitution, containing either of these elements as a common principle; and thus led them aside from the analogy suggested by their connection with the metallic oxides in neutralizing the acid properties, from which it might have been inferred, that they and the earths are compounds of metals with oxygen. Mr. Davy, availing himself of the powerful instrument of chemical analysis which galvanism affords, submitted potash and soda to its action, and succeeded in effecting their decomposition. Their bases are substances extremely peculiar; they have the metallic lustre, opacity and tenacity, but not the property formerly considered as characteristic of metals, that of great specific gravity, as they are even lighter than water; they are very fusible and volatile, and pass through these changes of form, as well as different states of cohesion, in a very limited range of temperature; they are also highly inflammable; combined with oxygen, they form these alkalis; and, if these bases are to be admitted as metallic, the analogy in chemical constitution is established between the alkalis, earths and metallic oxides. *Potash*, or, as it ought to be named, (in conformity to the rule of giving a similar termination to the names of substances belonging to the same order,) potassa, is obtained from the incineration of vegetables, especially from the

wood; the saline matter remaining after the wood has been burnt, consists principally of this alkali, in combination with carbonic acid, being freed from the impurities by lixiviation; this acid is abstracted by the action of lime, the alkali is obtained in solution, and, by evaporation, can be obtained in a solid state. It is of a white colour, crystalizable, fusible, and volatile at a higher heat; abundantly soluble in water, soluble also in alcohol, powerfully caustic, and possessed of all the alkaline properties in a high degree. There is some uncertainty, whether it exist in the vegetable matter from which it is procured in the state in which it is obtained, or whether its base is a constituent principle of that matter, and is oxygenated during the combustion: one reason for admitting the latter opinion, at least in part, is, that the alkali cannot be extracted in so large a quantity by any other process as by burning.

Potassium, as the base of potash has been named, is at the temperature of 32° a solid substance, hard and brittle, of a white colour, opaque, and with the lustre of polished silver; at 50° it becomes soft and malleable; at 60° it is in the form of small globules, somewhat consistent; at 70 it becomes more mobile and liquid; and at 100, it is completely so. It requires a temperature near to a red heat to volatilize it. It is lighter than water, or even than alcohol or ether. It is highly inflammable, when heated to its vaporific point, burning with intense heat and vivid light; at lower temperatures it combines more slowly with oxygen; it passes through various stages of oxidation to the maximum, when it forms the alkali, being then combined with oxygen in the proportion of 85 to 15. Such is the strength of its affinity to this principle, that it takes it rapidly from water, and from all the acids. It combines with the primary inflammables, and with the metals.

Soda, or mineral alkali as it has been denominated, in contradistinction to the other alkalis which has been distinguished by the epithet of vegetable, exists as a constituent principle of several saline mineral substances, but it is usually extracted from the combustion of marine plants. It is afforded by the combustion, combined with carbonic acid, and associated with various other saline substances, and is obtained pure by the same general process as that applied to potash. Whether it pre-exists in

sea plants, or whether these, in common with land vegetables, afford potash in burning, which decomposes the muriate of soda with which they are impregnated from their situation, so as to afford soda, has not been well determined. In its physical properties this alkali bears a considerable resemblance to the other. It is solid and white, crystalizable, though with difficulty, from its watery solution; extremely acrid and caustic, fusible and volatile from heat, having a strong attraction to water, changing the vegetable colours to a green, and possessing all the alkaline properties. From potash it is principally distinguished by the very different compounds it forms.

Sodium, the base of soda, is white and opaque, and has the lustre and appearance of silver; is soft and malleable; is somewhat lighter than water; it is less fusible than potassium, not losing its cohesion at a lower temperature than 120°, and requiring for its perfect fusion a heat of 180; it is also less volatile. When heated to ignition, it burns vividly; at lower temperatures it absorbs oxygen without undergoing combustion; it abstracts oxygen from water, and from the acids, frequently with inflammation. It appears to be susceptible of various degrees of oxidation; at the maximum when the proportion of oxygen is about 21 to 79, it forms soda. It acts on the inflammables and the metals nearly as potassium does.

Ammonia. This alkali has usually been denominated volatile, from its volatility compared with the others, even when it is combined with water, being considerable. In its insulated state it exists as a permanently elastic fluid; its odour is extremely pungent; water absorbs it in very large quantity, and this solution forms what is named Liquid Ammonia. Its volatility, or tendency to assume the elastic form, and its comparative dilution, lessen the energy of its action; and hence, though possessed of the general alkaline properties, it appears weaker than the others in the affinities it exerts. Its composition was supposed to have been established; nitrogen and hydrogen appearing, both from analytic and synthetic experiments, to be its constituent principles. When the composition of the fixed alkalis was discovered, and they were proved to be oxides, analogy evidently suggested the conjecture, that oxygen would probably also exist in ammonia; and Mr. Davy, from some experiments, conclud-

ed that this is the case, though these have not been fully confirmed by subsequent experiments. The analogy in the chemical constitution of ammonia to that of the fixed alkalis, has however been established by the important discovery that it affords metallic matter; Berzelius and Pontin, Swedish chemists, having found, that when the alkali is placed at the negative wire in the galvanic circuit in contact with quicksilver, the quicksilver increases in bulk, becomes thick, and at length a soft solid,—changes perfectly similar to what are produced in it by the addition of metallic matter, and which can scarcely be conceived to arise from any other cause. The matter producing these effects in the experiment, must have been derived from decomposition of the ammonia; and it is accordingly found, that when this substance receives oxygen, either from the air or from water, ammonia is reproduced. Either hydrogen or nitrogen must therefore be of a metallic nature, combined probably with a portion of oxygen; and it is not improbable that both these gases may be modifications of the same base. The analogy in constitution has thus been rendered complete, with regard to the three alkalis, and they, as well as the earths, are connected by a series with the oxides of what are more strictly denominated metals,—one of the most perfect examples of generalization which the science of chemistry affords.

The last important class of chemical agents is that of *Acids*. The characteristic acid properties are a sour taste, the power of changing the blue, purple, and green colours of vegetables to a red, and that of combining with the alkalis, earths, and metallic oxides, forming compounds, in which, when the combination is established in the due proportion, the properties of the acid and of the base with which it is united, are equally neutralized. The more powerful acids have a considerable degree of causticity; they have a strong attraction to water, and they act with energy on inflammable and metallic substances. All the acids are compounds of oxygen, and this element is therefore regarded as the principle of acidity. This truth was established by Lavoisier, with regard to a number of the acids, and extended by analogy to a few which had not been decomposed. It has been confirmed, with regard to these, by more recent investigations. The bases of the acids are either inflammable

or metallic. The production of acidity is usually the result of their full oxygenation, and in some cases the base combines with two proportions of oxygen, forming two acids, different in their properties from each other.

On these facts, with regard to the chemical constitution of the acids, their nomenclature is founded. The base being specific with regard to each acid, while the oxygen is common to them, it is from the name of the former that the name of the acid is derived; and, by a variation in the termination of this name, the different acids which may be formed from the base, by a difference in the degree of oxygenation, are distinguished; the name terminating in the syllable *ic*, when the acid is that which contains the larger proportion of oxygen, and in the syllable *ous* when it contains the smaller proportion. Thus sulphur forms two acids, by combining with two proportions of oxygen; the term sulphur is the radical whence the names of these are derived, and according to the above principle, the one is denominated the sulphuric, the other the sulphurous acid. Where a large quantity of oxygen can be farther combined with an acid without increasing, but rather diminishing its acid powers, the name is expressed by prefixing the epithet *oxy*, as oxymuriatic acid.

Acids have an extensive power of combination. From the numerous affinities they exert, and from the facility with which they afford oxygen, they are the most active of any of the compound chemical agents, and are hence employed in many pharmaceutic operations. Those of most importance under this view are the sulphuric, nitric, and muriatic.

The *Sulphuric Acid*, formed from the full oxygenation of sulphur, exists combined with a small quantity of water in the form of a liquid of great density, and from this state of concentration acts powerfully; exerting strong attractions to other bodies; and though, from the strength of affinity between its principles, it does not directly afford oxygen with facility to many substances, it enables them to attract oxygen from water, and thus subjects them to chemical change.

The *Sulphurous Acid*, which is formed from the same base in a lower degree of oxygenation, existing naturally in the elastic form, which is an obstacle to its entering into combination, and not being very largely absorbed by

water, so as to form a concentrated solution, is much weaker.

Nitric Acid is the result of the full oxygenation of nitrogen; and the oxygen, not being retained in the combination by a strong attraction, the acid yields it readily, and hence acts with more facility and energy on inflammable and metallic substance than any other acid,—oxidating the former, and first oxidating, and then combining with the latter; hence in pharmacy it is used as the most general solvent of the metals. What is named *Nitrous* Acid, is the nitric, with an impregnation of nitric oxide gas; it is of a yellow colour, and emits similar coloured dense fumes, while the other is colourless: the chemical agencies of both are nearly the same.

Muriatic Acid exists when uncombined in the aerial form, but it is absorbed in large quantity by water, and forms a liquid acid of considerable strength. Its analysis has not been effected; and even yet, by the action of potassium on it, there have been established only some singular facts, with regard to water combined with it, and the effect of this water on its acidity; the quantity of water in combination with the acid, even in its elastic state, is supposed to amount to at least one-third of its weight; and though the acid itself cannot be obtained free from this water, yet when combinations of it with other acids are procured in this state, the acid powers are completely suspended, and are restored on the addition of a little water. This acid, not directly affording oxygen to bodies, oxidates them only by enabling them to attract oxygen from the water it contains; it thus dissolves metals; and it farther combines with other substances, as the alkalis or earths. It is capable of uniting with an additional proportion of oxygen, forming what is named oxymuriatic acid, which, although its acid powers are weaker, imparts oxygen more readily to bodies. And, with a still larger proportion of oxygen, it forms a third acid, hyperoxymuriatic acid, which gives to the saline compounds in which it exists, the power of acting with much energy on inflammable bodies, in consequence of the very large quantity of oxygen condensed in the combination, and not retained by any great force.

Other acids, less important as pharmaceutic agents, are the Carbonic, Phosphoric, Boracic, and Fluoric.

Carbonic Acid, the product of the complete oxygena-

tion of carbon, existing in the elastic form, and being absorbed by water only in sparing quantity, has no very active chemical power, but is of importance from existing in many natural combinations, particularly of saline and earthy substances belonging to the Materia Medica. The characters eminently distinguishing it are its only weakening, not entirely neutralizing the properties of the alkalis, when in combination with them, and its being disengaged rapidly with effervescence by other acids from these compounds, and from those it forms with the earths.

Phosphoric Acid has phosphorus for its base, and the affinity between this base and the oxygen, with which it is combined, being strong, it scarcely acts on bodies by oxygenating them, but simply by entering into combination with them; nor are these combinations comparatively of much importance. *Phosphorous Acid*, in which the proportion of oxygen is smaller, is still less important.

Boracic Acid exists in the concrete form, and its chemical action is comparatively weak. So powerful is the affinity between its base and oxygen, that it has only been decomposed by galvanism, or by potassium; and its decomposition, there is reason to conclude, is even not complete: a dark olive coloured substance is obtained, inflammable, and which, by combining with oxygen, reproduces boracic acid; this substance being probably the real base in a lower degree of oxygenation.

Fluoric Acid is elastic, and is not very largely absorbed by water; its chemical action is from these circumstances, therefore, not powerful. It unites, however, easily with the alkalis and earths, and, what peculiarly distinguishes it, is capable of dissolving siliceous earth. It suffers partial decomposition from the action of potassium, oxygen being abstracted from it, and a chocolate coloured substance deposited which burns in oxygen and re-produces the acid.

There is a series of acids with compound bases, derived from the vegetable and animal system; but those of them entitled to notice will be best considered with the classes of substances with which they are more strictly connected. The acids combine with the alkalis, the earths, and the metallic oxides; and when the combination is established in the due proportion, the chemical properties of the acid, and of the base with which it is

united, are mutually neutralized. Hence these compounds are named *neutral salts;* and, as an order of chemical agents, they are distinguished by certain common properties. They can always be obtained in the solid state: they are generally, though not universally soluble in water; those of them which are soluble, are capable of assuming a crystaline form, the form being very different in different salts. Those which crystalize from their aqueous solution, always retain a quantity of water greater or less in combination, essential to the crystal, and therefore named their water of crystalization. When heated, the increase of temperature is often sufficient to enable this water to dissolve the real saline matter: this is named the watery fusion of salts; as it evaporates, the salt becomes concrete, and, by a farther increase of heat, is either fused or decomposed. The term neutral salt is sometimes restricted to those of which the alkalis are the bases: those formed from the earths are named *earthy salts;* and those from the metallic oxides *metallic salts.* The nomenclature of the whole series is in the modern chemical language simple, and, at the same time, systematic and precise. They are formed into genera and species, according to the acids, and the bases of which they are composed; the name of the genus is derived from that of the acid, the name of the species from that of the base with which the acid is united. Thus all the salts formed from sulphuric acid are considered as constituting one genus, and are named *sulphates;* and the name of each species is expressed, by adding the name of the base, as sulphate of soda, sulphate of lime, sulphate of iron, &c. The acid which sulphur forms in a different degree of oxygenation, the sulphurous, forms a different order of salts; these are named sulphites; and in like manner we have nitrates and nitrites, phosphates and phosphites, &c. Those formed from oxymuriatic acid are named oxy-muriats. Salts are sometimes formed with an excess of acid, or with an excess of base: the acid being considered as the principle forming the genus, these are distinguished by prefixing to the usual name the epithet *super,* when the acid is predominant, and the epithet *sub* when it is deficient, or when the base is in excess, as super-sulphate of potash, sub-carbonate of soda, &c. When an acid is combined in one compound with two bases, as sometimes happens, the names of both

bases enter into the name of the salt, as tartrate of potash and soda. Thus, by this simple system, a facility of nomenclature is afforded; the whole is uniform and systematic, and the memory is aided, by the name pointing out the nature of the salt; and the adoption of this nomenclature in pharmacy is an important improvement.

So far the chemical analysis of unorganized substances connected with the Materia Medica has been the subject of consideration. It remains to take notice of the analysis of those belonging to the vegetable and animal kingdoms,—a subject of much importance, particularly as it relates to the vegetable part of the Materia Medica, and which, from this importance, as well as from the nature of the substances themselves, requires to be considered with more minute details.

These two classes of bodies are distinguished by very obvious chemical characters. In unorganized substances, the principles are few, and are combined generally in very simple states of union; their analysis can be executed with accuracy; even the proportions of their principles can be determined with precision, and they can be again combined so as to form the decomposed substance, thus confirming the analysis by synthesis. But, with regard to the products of organization, while the composition, so far as it relates to the ultimate elements, is more uniform, it is with regard to the modes in which they are united much more complicated. They consist of a few common principles; but these, presented to each other in the vessels of the organic being, have been placed under circumstances indefinitely varied, and which art can very imperfectly imitate. Combinations of the same elements are formed, therefore, greatly diversified, and properties are derived from differences of proportions, or modes of union extremely minute. Hence their accurate analysis is executed with difficulty,—a difficulty increased by the circumstance, that these elements having strong mutual affinities, cannot in general be obtained insulated, but when the compound has been decomposed enter into new combinations liable to be modified by slight variations of circumstances; the proportions therefore can seldom be determined with accuracy, the modes of union in general remain unknown, and the confirmation by synthesis is entirely precluded.

Another character distinguishes these two classes. The composition of unorganized bodies being more simple, is not so liable to be subverted; their constituent principles being few, their affinities operate with more force, and the combination is more permanent. That of organized bodies being more complicated has characters precisely the reverse. Composed always of several elements, the affinities are more nicely adjusted, and are therefore more easily modified; and their principles having tendencies to enter into numerous forms of combination, slight variations of circumstances subvert the equilibrium. Hence the susceptibility of decomposition by which they are distinguished: they are liable even to spontaneous changes from the reaction of their elements, and when this is favoured by humidity, elevation of temperature, or the action of the air, new combinations are established, whence the original compounds are decomposed.

From the peculiar constitution of the products of organization, there are two kinds of analysis to which they are subject. The object of the one is to discover their ultimate composition; that of the other is less refined, being confined to the investigation of the proximate principles of which they are composed.

It is seldom that a vegetable substance is homogeneous. The seed, for example, the bark, or the leaves of a plant, is not of one uniform composition, but consists of various proximate principles in a state of mixture, or of slight combination, and capable of being easily separated from each other. Now, these are often connected with their medicinal virtues; the virtue residing perhaps not in the entire substance of the leaf, bark, or seed, but in a principle capable of being separated, and which may frequently be employed in its insulated state. Hence the importance of the analysis of the vegetable substances belonging to the Materia Medica, so far as relates to their proximate principles; the knowledge it conveys enabling us to employ them with more discrimination, and to submit them to the proper pharmaceutic treatment. An enumeration of their proximate principles, and more particularly of those on which their medicinal powers depend, accordingly always enters into their description as articles of the Materia Medica. This analysis is executed in various

modes, adapted to particular cases, according to the principles which form the vegetable substance.

An important principle is sometimes separated merely by heat. The temperature cannot indeed be elevated very high, as then the proximate principles of the vegetable would be themselves decomposed, and their elements brought into new combinations. But at heat comparatively moderate, as that of boiling water, this does not happen; and at this temperature several of the principles of plants, such as their essential oil, camphors, and some others not very well defined, are volatilized without decomposition, and of course can be obtained pure.

The action of different solvents is of more extensive use in conducting the vegetable analysis. Water dissolves several of their component principles, such as gum and extractive matter, tannin, saline substances, and some others. These are dissolved in greater or less quantity, and in more or less purity, according to the temperature of the water employed. In general, by raising the water to its boiling point, it is able to dissolve them more completely; but some of them are apt to be volatilized, and others altered in their composition, especially if the atmospheric air is not excluded. Of the substances which the water holds dissolved, part are separated as it cools; the gum can be precipitated by alcohol; the saline substances may be crystalized, or can be discovered by evaporating the solution to dryness, and exposing the mass to such a heat as will destroy the inflammable parts; and tannin is detected by its chemical tests.

Alcohol is another agent of much importance in executing the vegetable analysis. It dissolves the resin, balsam, camphor, and essential oil: these solutions are decomposed by water, each substance being separated, and discernible by its peculiar qualities. Equal parts of alcohol and water, or proof spirit as it is named, is also often employed as a solvent in the analysis of vegetables. Ether di solves nearly the same principles as alcohol. And the acids, alkalis, and soluble earths, are sometimes of utility as re-agents, in pointing out the existence of peculiar principles.

Lastly, in the analysis of vegetables, we are often able to procure several of their proximate principles, by mechanical means, particularly by expression. Sometimes, too, they exude spontaneously from the growing vegetable,

or are obtained by it from incisions made in the branches or trunk.

After we have discovered the proximate principles of vegetables, the next step is to ascertain their composition. This is an investigation attended, however, with much difficulty, as being liable to all the deceptions arising from a complicated analysis, and incapable of being confirmed by the surer test which synthesis affords.

The composition of these substances with respect to their ultimate principles is nearly uniform. All of them contain carbon and hydrogen, generally if not invariably united with oxygen: some farther contain nitrogen and phosphorus; and in others several of the metals, particularly iron and manganese, exist. Lime, too, and the two fixed alkalis, either pure or more commonly in combination with some of the acids, are not unfrequently constituents of vegetable matter. These latter substances, however, are seldom in any considerable proportion; nor in general do they appear to modify much the properties of the substances in which they exist. Nitrogen, and perhaps lime, when present, appear to have the most important influence, and with the exception of the few compounds of which they form a principal part, it may be said, that the vegetable proximate principles consist of carbon, hydrogen and oxygen; the differences in their properties being produced by differences in the proportions of these principles and of the modes in which they are combined.

That a difference in the proportions of these elements may give rise to the differences in the properties of the compounds which they form, cannot be doubted; since in many other cases of chemical combinations, where there is no difficulty in the analysis, differences equally important and well marked are produced by this cause. In vegetable substances we accordingly can often trace this as the cause without being able to point out any other. Thus, fixed and volatile oils have properties in many respects dissimilar: by analysis both are found to consist of carbon and hydrogen, united only in different proportions, the volatile oils having more hydrogen in proportion to the carbon than the fixed have: this is a cause sufficient to account for the difference in their properties; and it accords sufficiently with that difference, for hydrogen being a substance extremely rare and volatile, those compounds in which it predominates, as ether, alcohol,

and others, are in general light and volatile. The greater volatility, therefore, of the essential, compared with the fixed oils, may be ascribed to its predominance.

In other cases, it is probable that the mode in which the constituent principles of these substances are united, is the cause of the difference in their qualities. This is indeed a cause which can be but imperfectly investigated, either by analysis or synthesis; but it is conceivable *a priori*, and sufficiently confirmed by chemical facts, that a difference in the mode of union may give rise to very important diversities of properties. If a compound, for example, consist of three elements, these may be united in two modes. Their attractions may be reciprocally balanced, and they may form what is named, in strict propriety, a ternary combination; or, from a variation in the circumstances under which the union has been effected, two of them may be combined, and the compound thus formed may exert an attraction to the third principle, unite with it, and form a new substance. The compounds resulting from these different modes of combination, though composed of the same principles, united perhaps even in the same proportions, would still have properties different from each other. Still greater diversities will be produced where the elements are more numerous, and the possible modes of union of course more diversified. And when we consider these causes from difference of proportions, and modes of combination, we shall scarcely be surprised at the number of different substances, immense as it is, which nature forms from a few elementary principles.

The proximate principles of vegetables are sometimes analyzed by exposure to heat: their elements enter into new combinations, and from the nature of the products, we discover what the principles were. Thus, if the substance exposed to heat yields a large quantity of acid, we conclude that it contains a considerable quantity of oxygen as a constituent part. If it afford much empyreumatic oil, we infer that it contains a large proportion of hydrogen, this principle being necessary to the constitution of that product. When ammonia or prussic acid is afforded by this kind of analysis, we conclude, for the same reason, that nitrogen has been a constituent principle. And by the same mode are discovered the earths and metals which had been present in it; these remaining after

the volatile parts have been expelled. Lastly, by the quantity of charcoal which remains as a residuum, we can form some conclusion as to the quantity of carbon which the vegetable substance contained. There analysis is also effected by exposing them to heat with the access of atmospheric air, and collecting the products of the combustion that takes place. From the nature of these products, we can ascertain the proportions in which they were united. Oil, for example, when subjected to this analysis, yields nothing but carbonic acid and water. We conclude therefore that it is composed of carbon and hydrogen, since these principles, united with oxygen, form these products, and since, if any other simple substance had existed in the oil, it would have appeared either pure or in combination with oxygen. We can even determine in this manner the proportion in which the carbon and hydrogen existed in the combination. From knowing what quantity of carbon exists in a given quantity of carbonic acid, and what quantity of hydrogen exists in a given quantity of water, we thus also discover whether any oxygen had existed in the composition of the oil.

They are sometimes analyzed by subjecting them to spontaneous decomposition. It is thus that sugar is brought into the state of fermentation; and from the products of the fermentation the principles of the saccharine matter are determined.

Lastly, their analysis is sometimes executed by the agency of the nitric acid, which communicates to them oxygen, and by the product ascertains the nature of their acidifiable base.

Such are the methods by which these principles of vegetable matter are analyzed. It is to be remarked, that the analysis is so difficult, as to afford, even when executed with the greatest care, only approximations; and as applied to the articles of the materia medica is seldom of utility, since we can scarcely ever discover any relation between the ultimate composition and the medicinal powers of the substance analyzed. These, in common with all its properties, no doubt depend on that composition; but our modes of analysis are still too limited and imperfect to admit of our tracing the connection between them. The application of chemistry, therefore, to the vegetable substances belonging to the materia medica, is, as has already been remarked, in a great measure confined to the discrimination of their proximate principles.

The proximate principles of vegetables are numerous, and of very different kinds. They are not all to be met with in every vegetable, or in every period of vegetation: some exist only in certain plants, and that only in their state of vigour and maturity: at other times they are to be found only before they have arrived at that period; some are deposited in particular organs; others are diffused through the whole substance of the vegetable, and mixed in a manner more or less intimate with all its parts: and some are nearly peculiar to certain vegetables, while others are common to almost every plant. Those only require to be pointed out in this sketch, which are particularly connected with medicinal properties.

These principles are the products of vegetation from a common juice or sap, which circulates freely through every part of the vegetable system, being supplied by absorption from the soil, and perhaps from the atmosphere. It varies in its qualities, particularly according to the season, and the progress of the plant to maturity; frequently too it has an intermixture of the proper juices: it always contains the usual elements of vegetable matter, with generally saline substances, having principally lime for their base. By the chemical changes it suffers from the action of the vessels of the plant, aided by the action of the air and of light, its elements pass into various states of combinations, whence the peculiar products of vegetation are formed.

The first transition of the sap appears to be into *mucilage*, or *gum*, one of the proximate principles contained in greatest abundance in vegetables. It is found in all young plants, in greater or less quantity; and is often so abundant in the plant, as to be discharged by spontaneous exudation. It abounds also in their roots, stalks, and leaves, and especially in their seeds. It is an inodorous, insipid, and glutinous substance, soluble in water, in every proportion, and forming with it a thick viscid solution, which by evaporation affords a tenacious mass, that when dried is brittle, and again soluble. It is insoluble in alcohol, ether, or oil, and is precipitated from its solution in water by the addition of alcohol. It does not absorb oxygen from the atmosphere; though its solution becomes sensibly acid by keeping, owing to partial spontaneous decomposition, and the combination of part of the principles of the gum, so as to form acetic

acid. Exposed to heat it is neither fusible nor volatile. At a temperature superior to 212, but inferior to that of ignition, it is decomposed; its principles entering into new combinations: the products are an acid liquor consisting principally of acetic acid, carbonic acid, and carburetted hydrogen gases, with a little ammonia, and a residuum of charcoal containing lime, one ounce of gum, affording six grains of lime. This lime is also detected by adding sulphuric acid to a solution of gum. From these products of the analysis, it is evident that the ultimate principles of gum are, oxygen, hydrogen, and carbon, with smaller proportions of nitrogen and lime. Gum is not capable of passing into the vinous fermentation, which appears to be owing to the portion of lime existing in it, as lime has the effect of preventing even sugar from suffering this change.

Gum is not inflammable; for although, when heated, in contact with atmospheric air, it combines with oxygen, it emits no flame. The principal products of this combination are carbonic acid and water. By the action of nitric acid it is converted into oxalic, malic, and saccholactic acids. Oxymuriatic acid converts it into citric acid.

Gum is usually obtained either by spontaneous exudation, or by incisions made in the trunks and branches of trees. It is more or less pure as it is obtained from different plants. Its existence in vegetables is detected by boiling gently the vegetable substance with water; the water dissolves the gum, and if much of that principle be present the solution is glutinous. It may be allowed to remain till the impurities have subsided; then be evaporated to the consistence of thin syrups; and the addition of three parts of alcohol will separate the whole of the gum in flakes.

Pure gum is not an active substance, considered with respect to its effects on the living system. In medicine it is only used for its lubricating quality; and so little activity does it exert, that it has often been taken for a considerable time as an article of food. From its chemical properties it is of rather more importance. As a component part of vegetable matter, it renders the other parts more soluble in watery liquors, and may thus favour their action on the stomach. In pharmacy it is used as a medium to combine balsams, resins, and oils, with water.

If a small quantity of any of these substances be triturated with a little gum or mucilage, on the addition of water they remain suspended in it, forming a white milky like mixture, retaining all the properties of the balsam or oil. Though pure gum is thus inactive, yet the virtues of many vegetables depend on a gummy matter.

Fecula is a principle approaching in several of its characters to gum. Like it, it is soluble in hot water, and forms a viscid glutinous solution; but it is at once distinguished by being perfectly insoluble in cold water. It exists principally in the tuberose roots and gramineous seeds. It is extracted by beating the dried root or seed with a large quantity of water; the liquid soon becomes milky, from the diffusion of a white powder through it. On being poured from the remaining vegetable matter, and allowed to remain at rest, this powder is deposited, and when washed and dried is the fecula of the plant. It is generally mild and insipid, of a white colour, with a peculiar kind of brilliancy, soft to the touch; but portions of the other principles of the plant sometimes adhere to it, from which it receives colour, smell, and taste. Starch is the fecula of wheat, and is the most abundant part of that grain.

Fecula is insoluble in alcohol. The action of the acids on it is somewhat analogous to that they exert on gum, dissolving it when they are weak or diluted, but decomposing it when they are more concentrated. The alkalis also dissolve it. Exposed to heat, it is charred, and suffers decomposition, affording products which indicate carbon, hydrogen, and oxygen, to be its constituent principles. A property eminently characteristic of it, and probably depending on its composition, is that of being convertible into saccharine matter, and thence ultimately passing into the vinous fermentation,—a property not belonging to gum or any other principle. This conversion takes place in germination, and is accompanied with an absorption of oxygen, and formation of carbonic acid.

Fecula is a substance highly nutritive, and is usually contained in those plants which serve as food. It is sometimes employed in its pure state in medicine, on account of its nutritive quality, and from its being easy of digestion: sago and salop are substances of this kind.

Gluten. This principle is usually associated with fecula, and is obtained in the process in which the fecula is

separated. It then appears as a viscous, elastic, and fibrous like substance, which from its close resemblance to the animal product named Gluten, has been denominated vegetable Gluten. It is obtained from the flower of wheat in greatest abundance: the flower is made into a paste with water, which being compressed by the hand, while a stream of water falls upon it, the fecula is carried off in the state of powder: the mucilaginous and saccharine parts of the grain are dissolved by the water; and there remains a tenacious ductile mass, forming the gluten: it has scarcely any taste, is of a greyish colour, and when dried is semi-transparent, resembling glue in its appearance: it is insoluble in water, and is dissolved in very small quantity, by alcohol: by the action of nitrous acid, it is converted into oxalic acid, giving out, at the same time, nitrogen gas: decomposed by heat, it affords a large quantity of ammonia, and it is subject like animal matter to putrefaction. It contains a larger proportion of nitrogen than any other vegetable product does, and it is supposed to render those vegetables in which it is present highly nutritive.

Another principle occasionally found in vegetables, but belonging more exclusively to animal substances, is that which has been named *Albumen*, from its resemblance to the animal principle of that name. It is soluble in cold water, its solution being coagulated by heat: it is coagulated also by alcohol, but is dissolved by the alkalis: like gluten it is liable to putrefaction, and furnishes a large quantity of ammonia by distillation. This principle is found in hemlock, scurvy grass, cresses, and several other plants, and is obtained from the fresh expressed juice of the leaves when they are heated nearly to the boiling point; the albuminous matter coagulating, and separating in the form of flakes. A similar separation takes place on the addition of spirit of wine. It is contained also in the seeds of other plants, particularly in the different nutritive grains; in the farina of wheat, for instance, it is found dissolved in the water which is employed in separating the fecula from the gluten. This principle, it may be added, has been regarded, and perhaps justly, as a variety of gluten; it differs little from it in chemical properties; and the peculiar physical qualities supposed to be distinctive of gluten are obviously derived from the process by which it is obtained.

Saccharine Matter. This exists in many vegetable substances, especially in their fruits and roots, but often intimately united with their mucilaginous and extractive matter. When freed from these, its taste is sweet, without any peculiar flavour; it is soluble in water and in alcohol; is capable of crystalizing; its watery solution enters first into the vinous, and then into the acetous fermentation.

By the action of nitric acid, it is converted into oxalic acid; by decomposition by heat, it affords a large quantity of empyreumatic acetic acid, a small quantity of empyreumatic oil, carbonic acid and carburetted hydrogen gases, the residuum being charcoal. It consists, therefore, of carbon, hydrogen, and oxygen; and from the large quantity of acid which its analysis yields, it appears to contain more oxygen than any other vegetable substance that is not acid.

Sugar appears to be formed from the fecula of the vegetable in which it exists. It contains nearly the same principles as it does, and the operation of malting throws considerable light on its formation; in this process, the fecula of grain is converted into saccharine matter, oxygen is absorbed, and carbonic acid formed; and this abstraction of carbon, if it constitutes the whole change, of course proves that the sugar, which is the product of the operation, has an increased proportion of hydrogen and oxygen. Saccharine matter has little activity, though there are some varieties of it, in which some weak medicinal powers reside.

Oil is a common proximate principle of vegetable matter; it is of two kinds, expressed or fat oil, and distilled, volatile, or essential oil. These have the common qualities of unctuosity and inflammability; but they also possess peculiar properties, by which they are distinguished as distinct species.

The expressed, fat, or fixed oils are thick and unctuous, insipid and inodorous; they congeal on exposure to cold, are lighter than water, and insoluble in that liquid; they are likewise insoluble, except in very minute quantity, in alcohol, and they combine with the alkalis, forming soap. They are not volatilized at the temperature of 212°: some require to be raised to 600 to make them boil, and the condensed oil is changed in its properties. At a temperature somewhat higher they are decomposed in close

vessels, and burn when the atmospheric air is not excluded. They also slowly absorb oxygen at a low temperature; a small quantity of an acid is formed, which renders them rancid; by longer exposure to the air, they are inspissated, and even become at length concrete. Those oils in particular which have been expressed with the aid of heat, and which are named drying oils, suffer this last change, and are ultimately converted into a resinous matter.

Expressed Oils consist chiefly of carbon and hydrogen, as is established by the products of their decomposition by heat, which are chiefly carburetted hydrogen and carbonic acid. The products of their combustion are water and carbonic acid.

These oils are generally contained in the seeds and fruit of vegetables, and only at the period of their maturity. They are extracted by expression, or by decoction with water; they are frequently impregnated with part of the extractive, mucilaginous or resinous particles which the seed or fruit contains; from which they derive colour, and in many cases peculiar taste and odour, and even perhaps certain medicinal powers. In general, however, they have little activity as medicines. They are mild and emollient, and are used principally for these virtues. They are rendered miscible with water by the medium of gum or sugar, or by the addition of a small quantity of any of the alkalis.

Volatile or essential oils have characteristic properties different from those of the expressed oils. They are volatile at a low temperature, and are entirely and quickly converted into vapour at the heat of boiling water, without being decomposed; they are soluble in a small proportion in water, and hence the impregnation which water receives from many vegetables by distillation. In alcohol, they are completely soluble; but they do not combine with the alkalis with facility; they are in general odoriferous, pungent, and even acrid; they are more highly inflammable than the fixed oils, and by exposure to the atmosphere they slowly absorb oxygen, are thickened and coloured more deeply, loose much of their smell and pungency, and are at length converted into substances of a resinous nature. This change is partly owing to the escape of part of the oil, but principally to the oxygen absorbed combining with part of the hydrogen.

These oils, from their analysis by heat, or by combination, appear to consist principally of carbon and hydrogen. They differ from the fixed oils in containing a larger proportion of hydrogen; hence they are more volatile, and more inflammable, and during their combustion they afford a larger quantity of aqueous vapour.

Volatile oils are less abundant in the products of vegetation than some other principles; they do not exist indeed in any considerable quantity but in the aromatic plants: in some plants, the oil is confined to the flowers, fruit, leaves, or bark; sometimes it is contained in several of these parts, and in a few instances it is found diffused through every part of the plant. The quantity varies, not only according to the age, but also according to the vigour of the plant; hence it is much influenced by climate, soil, and season. It is remarkable, that some of the most odoriferous flowers, as the rose or jessamine, yield scarcely any essential oil, though they lose their flavour by a gentle heat.

Some of these oils, being contained in distinct vesicles, may be obtained by simple pressure. In this manner, essential oils can be obtained from orange or lemon rind. More usually, they are procured by distillation; the vegetable is boiled in water; the essential oil is volatilized with the aqueous vapour; both are condensed in close vessels; the water has the taste and flavour of the plant, from having dissolved a small part of the oil: the greater part of it, however, is collected pure, either swimming on the surface of the water, when the oil is lighter, as is generally the case, or in a few cases, when it is heavier, having fallen to the bottom.

The essential oils of vegetables may be considered as medicines of some activity. They have always the odour and generally the taste of the vegetable from which they are obtained; accompanied with more or less pungency. Some of them, however, are less pungent and less acrid than the vegetable matter from which they are procured, these qualities residing in the resin, or some of the other proximate principles.

A proximate principle, found in some vegetables similar in many of its properties to essential oil, is *Camphor*. It is a solid substance of a white colour, semitransparent, having a strong peculiar smell, and a penetrating taste; tenacious, and slightly unctuous to the touch. It is very sparingly

soluble in water, but is completely soluble in alcohol, ether, and oils; from these solutions, it is precipitated by the addition of water. It evaporates entirely, though slowly, at the common temperature of the atmosphere; at a higher temperature, in close vessels, it is sublimed without alteration; it is also highly inflammable, the product of the combustion being carbonic acid, and a quantity of what is named camphoric acid. It is acted on by the more powerful acids, sulphuric acid charring it and forming a portion of tannin; nitric acid dissolving it, and decomposing a portion of it, converting it into an acid; muriatic, fluoric, acetic and carbonic acid dissolving it, without materially changing its composition, as the greater part can be precipitated by water. Nitric acid, repeatedly distilled from it, converts it into a concrete acid, named camphoric acid, which appears to be different from any known acid.

By particular management, camphor may be decomposed by heat. If it is intimately mixed, with six parts of clay, and made into small balls, by the addition of water, its volatilization is prevented, and, by the heat which may be applied to it, its decomposition is effected. A volatile oil, fragrant and pungent, of a golden yellow colour, amounting to one third of the weight of the camphor, distills over; a quantity of charcoal, about one fourth of the weight of the camphor, remains; the remaining products of the decomposition are carburetted hydrogen, carbonic acid gas, and camphoric acid. From the result of this analysis, camphor appears to differ from the essential oils, principally in containing a much larger proportion of carbon, since, by its decomposition, by heat, it is resolved principally into charcoal, or compounds of carbon, and into an oil, which has all the properties of essential oil, being odorous and pungent, volatile and inflammable, soluble in alcohol, and precipitated from it by the addition of water.

Camphor is found in distinct vessels, in the wood and bark of certain vegetables. It is also contained in many essential oils, as those of lavender, sage, and others, from which it is deposited on long keeping. The curious fact has been established, that it may be artificially formed, this formation of it taking place in the action of muriatic acid on oil of turpentine

The same relation which camphor bears to the volatile, wax seems to have to the fixed oils. This substance, though formed perhaps by the bee, is also a product of vegetation; it is yielded by the leaves and fruit, and it is sometimes intimately mixed with the resin, gum, or extractive matter of plants. It is insoluble in water, and is soluble in very small quantity with the aid of heat in alcohol. It combines with the fixed alkalis, though with some difficulty. It unites easily with the expressed oils. It melts at a moderate heat. By distillation in close vessels it affords an acid, and a considerable quantity of thick oil, a small quantity of charcoal being the residuum.

Resin. This principle is in some measure connected with essential oil, and in plants is often united with it, as well as with other principles. Some vegetables, however, exude juices which concrete into a matter entirely resinous, and it is from these that the characters of the substances belonging to this genus are taken. The distinguishing properties of a resin are its existing in a solid state, being insoluble in water, but soluble in alcohol, ether, and oils; the solution in ether or alcohol is decomposed by water; resins are in general odorous and sapid, though neither of these qualities is essential to a pure resin; they are inflammable, and burn with much smoke, at a temperature nearly that of boiling water they melt; but they cannot be volatilized without being decomposed. In close vessels the product of their decomposition by heat are water, empyreumatic acetic acid, an empyreumatic oil, and a residuum of charcoal, indicating carbon, hydrogen, and oxygen, to be their ultimate principles. At the common temperature of the atmosphere, they do not combine with oxygen; neither are they acted on by water; the solutions of them in alcohol are therefore employed under the form of varnishes, to preserve other bodies from alteration by exposure to the air. They are dissolved by the fixed alkalis, likewise by some of the acids, especially the acetic: the stronger acids decompose them.

The existence of resin in a vegetable is discovered by infusing it in alcohol; this dissolves the resin, if any is present, and it can then be precipitated from the solution by the addition of water. The method of estimating the quantity of resin in any vegetable is by ascertaining the increase of weight which alcohol acquires from it by

digestion, or the alcohol may be evaporated by a moderate heat, and the resin obtained pure.

Resins are in general more active than gums, with respect to their medicinal powers. The purest resins are indeed nearly inert, but there are many vegetable substances which act powerfully on the system, that appear to consist principally of resinous matter, and it is in this resinous part that their powers reside. The proper solvent or menstruum of resin is alcohol; by this it can be extracted from some of the other constituent parts of vegetables, though there are others which are soluble in the same fluid, and therefore it is difficult to obtain the resin pure. Though resin is insoluble by itself in water, yet part of it can be taken up, and kept suspended by the medium of gum. These two principles are often naturally mixed in vegetables forming what are named gum-resins, and some of the most active articles of the Materia Medica are natural compositions of this kind. Their properties are derived from the two principles of which they consist: thus, they are only partially soluble either in water or in alcohol; they are soluble in alkaline liquors; they are not fusible by heat, they only soften, and if the heat is raised higher are decomposed, affording a little ammonia with the usual products, probably derived from the gum they contain. The proportions of gum and resin, thus mixed, are in different substances of this family very various; but they are generally such, that a mixture of equal parts of water and alcohol dissolves the gum resin. This is their proper solvent; it also dissolves some other vegetable principles, particularly extract, and hence it is the menstruum most generally used in Pharmacy to extract the active matter of vegetables.

Balsams are resinous juices, with an intermixture generally of essential oil, and containing always a portion of the acid named Benzoic Acid. They are usually thick and tenacious, becoming by age concrete. They are odorous and pungent, principally from the essential oil they contain.

A principle of considerable importance in its pharmaceutic relations, is what has been named by the French chemists, by whom its characters were first established, Extract, or Extractive Matter, and which is supposed to constitute the active matter of many vegetables. Its leading character is that it is soluble equally in pure

water and in alcohol; and hence a solution of it in the one fluid is not precipitated by the addition of another. By this property, it is distinguished both from gum and resin, the one being insoluble in water, the other in alcohol. The compound of the two, or gum resin, is indeed partly soluble in either of these fluids, but it never is completely so, since if it contain as much gum as renders it soluble in water, it is only partially dissolved by alcohol; and if it consist principally of resin so as to be completely dissolved by alcohol, it is imperfectly dissolved by water. If a gum-resin be digested with alcohol, the tincture it affords is decomposed by water, and, *vice versa*, its watery solution is decomposed by alcohol.

There is another character by which extractive matter is distinguished, that of suffering decomposition when exposed in a humid state to the atmospheric air; this takes place even at natural temperatures, and with still more rapidity when the temperature is raised, as when the extractive matter is boiled in water; it then becomes insoluble and comparatively inert. This change, Fourcroy ascribed to the fixation of oxygen. According to T. Saussine, oxygen is indeed absorbed, but carbonic acid is at the same time formed; he supposes too, that part of the oxygen and hydrogen of the extractive matter combine and form water, and that the inert insoluble precipitate has therefore an increased proportion of carbon. It is from this cause apparently that the medicinal powers of many vegetables are injured by decoction in water, with the admission of air, and not, as was at one time believed, from the dissipation of any volatile active principles; many plants indeed which sustain injury from this operation, containing no such principles.

By oxymuriatic acid, extract is converted into a concrete substance of a yellow colour, insoluble in water, probably from a similar change. It exerts affinities to argil and to metallic oxides. By heat it is decomposed, affording empyreumatic oil and acid, with a portion of ammonia; and in this, as well as in its spontaneous decomposition, when the re-action of its elements is favoured by humidity, it leaves as a residuum carbonates of potash and lime.

This principle is supposed to be the base of what are named the Extracts of Plants;—preparations formed by boiling vegetables in water, and evaporating the clear

liquor to a thick consistence. As procured in this way it must generally have an intermixture, greater or less, of those principles, which are soluble in water; and from being so liable to decomposition, it must be injured during the evaporation. It is the basis, too, though in a similar state of intermixture and partial decomposition, of what are named the inspissated juices of plants. It exists also in the seeds, leaves, bark and wood.

Though the characters of this principle appear to be distinctive, there is still some ambiguity with regard to it, particularly from the circumstance, that these characters are not uniform; a principle existing in some vegetables which has some of these distinctive properties, without the others; as, for example, in Peruvian bark, the active matter of which is rendered inert and insoluble by decoction in water, and so far has one of the peculiar properties of extract; while it has not the other, that of equal solubility in alcohol and water, but is more soluble in the former than in the latter. Nor is there any certainty that this extractive matter has been obtained pure and insulated; and is therefore possible that it may consist of some of the other principles in a state of mixture, their properties being modified by their reciprocal action.

Tannin. The important medicinal property of astringency, appeared from some chemical facts to be dependent in vegetable substances on a peculiar principle, as it is discoverable in them by a chemical test, that of striking a deep purple colour with the salts of iron. This effect is exhibited by all the powerful vegetable astringents, and in a degree nearly proportional to their astringency. A peculiar acid having been discovered to exist in these astringents, afterwards named Gallic Acid, it was supposed to be the principle on which this property depends. But subsequent experiments have proved, that it resides in a principle of a different nature, which being the agent chiefly concerned in the operation of tanning, has received the name of Tan or Tannin.

This principle exists in all the powerful vegetable astringents; it is extracted by maceration with water, and is detected in the infusion by a peculiar test, that of the animal principle denominated Gelatin. If a solution of gelatin is added to the infusion, it becomes turbid, and a precipitate is thrown down composed of the tannin and

gelatin in combination. We have no very perfect process for obtaining tannin in an insulated state; but the most simple is precipitating it from the infusion of a vegetable astringent by lime water, and afterwards submitting the compound of lime and tannin, which is formed, to the action of dilute muriatic acid, which abstracts the lime, and leaves the tannin.

Tannin evaporated from its solution is loose and friable, having a resinous fracture, of a brown colour, a peculiar odour, and a taste rough and bitter. It is soluble in water, either cold or warm, and in alcohol not very highly rectified. It appears to suffer decomposition from exposure to the air in a humid state. By the acids, it is precipitated from its watery solution, and by some of them is decomposed. It unites with the alkalis, forming soluble compounds; with the earths it forms compounds of sparing solubility; it exerts affinities to the metallic oxides, and it is principally from its action that infusions of vegetable astringents produce dark coloured precipitates with metallic salts. Exposed to heat, it affords an acid liquid, an oil, and a considerable quantity of carbonic acid, leaving a spongy charcoal.

Its action on animal gelatin is its most important property in relation to the object of the present outline, as on this probably depends its astringent power; it combines with it, forming an insoluble precipitate, whence it corrugates and renders more dense the animal fibre of which gelatin constitutes a principal part. It exists in all the powerful vegetable astringents, mixed with extractive matter, mucilage, gallic acid, and other principles. It has also been established, that it is capable of being artificially formed, principally by the action of sulphuric and nitric acids on vegetable products which abound in carbonaceous matter.

Vegetable Acids. The acid found in the juices and other parts of plants, is not always the same. Not less than seven acids, different from each other, are of vegetable origin,—the gallic, oxalic, malic, citric, tartaric, benzoic and acetic. To these may be added the prussic, though this is more peculiarly formed from animal matter.

Gallic Acid. The existence of this acid in some of the more powerful astringents, particularly in the gall nut, can be discovered by their watery infusion reddening the infusion of litmus. If the concentrated infusion be left

exposed to the air for some months, this acid is deposited in the state of a crystaline deposite, mixed with mucous flakes, from which it may be purified. It may also be obtained by sublimation from the gall nut, or even by distillation with water, though it is doubtful whether, as procured by these or other processes, it is altogether free from tannin; that by sublimation appears to be most so. By crystalization it is obtained in slender prisms of a white colour; its taste is sour, and it reddens the vegetable colours; it is soluble in twenty-four parts of cold, and in less than two parts of boiling water; it is also soluble in alcohol. It suffers decomposition from heat, and the process indicates a large quantity of carbon in its composition. It combines with the alkalis and earths, and also with the metallic oxides, forming with the latter, in general, coloured precipitates; it is doubtful, however, whether these colours are not in a great measure derived from the tannin adhering to it.

Gallic Acid was at one time supposed to be the principle of astringency, from being contained in the vegetable astringents, and giving a dark colour with the salts of iron, the chemical test by which astringency appears to be indicated. It is doubtful, however, as has been just remarked, whether this latter property does not arise from the presence of tannin: the colour it does produce is less deep too, than that which the infusion itself strikes; and the acid in its insulated state has no astringency: tannin is much rather to be considered as the astringent principle, and it exists accordingly in some of the more powerful vegetable astringents, as in catechu or kino, with scarcely any trace of gallic acid.

Malic Acid is contained in the juice of unripe apples, and other fruits, it is uncrystalizable, forming when evaporated merely a thick liquor, which, if the heat be continued, becomes charred. By this and by the properties of the salts which it forms, it is principally distinguished from the other vegetable acids.

Citric Acid often accompanies the malic acid in the juices of unripe fruits, and it exists in a purer form in the juice of the lemon and lime from which it is extracted; the mucilaginous matter of the juice being separated by alcohol. It crystalizes in rhomboidal prisms; which, when it is pure, are colourless; its taste is extremely sour, it is abundantly soluble in water; its solution under-

goes spontaneous decomposition, but the crystalized salt can be preserved without injury. The more powerful acids decompose it, converting it principally into acetic acid.

Oxalic Acid exists in the juice of the sorrel (oxalis acetosella) and some other plants, combined with a portion of potash not sufficient to neutralize it. It can also be artificially formed by subjecting fecula, gum, or sugar, to the action of nitric acid. It crystalizes in slender prisms of a white colour; its taste is extremely sour; it is soluble in twice its weight of cold water, and an equal weight of boiling water, it is also soluble in alcohol. It is decomposed by the more powerful acids: in its decomposition by heat, it affords little empyreumatic oil; hence it appears to contain a small proportion of hydrogen; and as some of the other vegetable acids are converted into it by the action of nitric acid, there is probably a large proportion of oxygen in its composition. The test by which it is peculiarly distinguished, is the insoluble precipitate it forms with lime, which it attracts from all the other acids.

Tartaric Acid. This acid, as it exists in vegetables, is usually combined with potash, in such a proportion, however, as to leave an excess of acid in the combination. This forms the super-tartrite of potass which is contained in a number of vegetable fruits. It is deposited from the juice of the grape in its conversion into wine, or in the slow fermentation which the wine suffers when kept. The acid procured from this salt is in tabular crystals, transparent; they are very soluble in water, the solution when concentrated being of an oily consistence. It is decomposed by heat, affording a large quantity of liquid acid little changed, with much carbonic acid gas. By nitric acid repeatedly distilled from it, it is converted into oxalic acid. This acid is an important one in pharmacy, from the numerous combinations of it applied to medicinal use.

Benzoic Acid is obtained from the vegetable balsams, generally by the process of sublimation. It condenses in slender crystals, white and brilliant. It is volatile, as this mode of preparation shews; its vapour is also inflammable, it is very sparingly soluble in cold water, but abundantly in hot water, the solution on cooling depositing nearly the whole of the acid in prismatic crystals: it is also soluble in alcohol, from which it is precipitated

by cold water; it is pungent, but not very acid to the taste: in its usual state its smell is fragrant, especially when it is heated; but this odour has been supposed to arise from a minute portion of the oil of the balsam adhering to it; as by repeated combinations with an alkaline base and precipitation by an acid, it is obtained at length inodorous. It is not easily decomposed by the action of the more powerful acids. Decomposed by heat, it affords a larger quantity of empyreumatic oil than any other vegetable acid, whence hydrogen is supposed to predominate in its composition.

Acetic Acid. This acid has been considered as more exclusively the product of fermentation; it exists likewise, however, ready formed in the sap of the vine, and, combined with alkalis and earths, very generally indeed in the sap of plants. In its pure and concentrated state, in which state it can be procured only by artificial processes, it is a very powerful acid, highly pungent and fragrant, volatile and inflammable, and is distinguished by the peculiar action it exerts on some of the other proximate principles of plants,—essential oil, resin, gum-resin, camphor, gluten, and caoutchouc, which it dissolves without decomposing. Hence, even in its diluted state, under the form of distilled vinegar, it is sometimes used as a solvent in pharmaceutic processes; though it is seldom that it can be employed to advantage, as it is liable to modify the powers of the substances it dissolves.

Prussic Acid. The substance to which this name is given, is formed from some varieties of animal matter by artificial processes. It had often been remarked, that its odour is similar to that of the peach blossom, and that the same odour is perceptible in the distilled water of the cherry laurel, and of the bitter almond. This led to experiments on these; whence the fact, rather singular, has been discovered, that all of them contain this acid. The fact, not less important, has been established, that the narcotic property possessed by these distilled waters depends on the prussic acid. In its insulated state, this substance is volatile, so that it escapes even from its watery solution under exposure to the air. It has no sensible sourness, and does not redden even the more delicate vegetable colours. The character of acidity is therefore given to it, rather from its powers in the combinations it forms,

especially those with the metallic oxides, than from its properties in its insulated state.

Several of the vegetable acids, particularly the citric, malic, and tartaric, exist together in the same vegetable, and in proportions varying according to the stage of vegetation, whence it is probable that they are mutually convertible. They seldom exist pure, but generally in combination with saccharine, mucilaginous and extractive matter. Combined with alkaline and earthy bases, they form what have been named the essential salts of plants.

The last of the proper proximate principles of vegetables is lignin, or wood; the substance which, composing the vessel of the plant, is the basis through which the other principles are diffused, or to which they are attached, and which is the basis therefore of all the parts of vegetables, with the exception of their secreted juices. It is, when freed from the principles diffused through it, insipid, inert and insoluble, liable in a humid state to slow spontaneous decomposition, inflammable and decomposed by heat, leaving a large residuum of charcoal, which indicates carbon to be its predominant ingredient, whence probably arises its solidity and comparative chemical inactivity. Being insoluble in water, or in alcohol, it forms the greater part of the residuum, when the active matter of vegetable substances has been abstracted by maceration in these solvents.

Besides the principles which can thus be obtained in a distinct form from vegetables by analysis, there are others of a more subtle nature, which have been supposed to exist in vegetable matter, though scarcely capable of being exhibited in an insulated state; such are the Aroma or Spiritus Rector of Plants, the Acrid Principle, the Bitter Principle, and the Narcotic Principle.

The *Aroma* is the principle in which the odour of plants has been supposed to reside. This quality is generally found in the essential oil; but there are some vegetables, having a strong odour, which yield little or no essential oil; such as the jessamine, the violet, or the rose; or, if this oil be procured from them in small quantity, it has not that strength of odour which, considering their fragrance, and the smallness of its quantity, might be expected from them. They exhale this odour, however, when exposed to the air; it is at length dissipated, or it is communicated to water by distillation at a very gentle

heat. Hence it has been concluded, that a principle more subtle than the essential oil exists in which the odour resides, and that it is even this principle which communicates odour to the oil.

These facts, however, are altogether inconclusive. The property of odour may belong to any of the proximate principles of vegetables, and does belong to principles of very different kinds; it exists in other bodies in which we cannot suppose the existence of any common principle; nor is there any reason to assume the existence of such a principle in plants: and all the facts which have been considered as favourable to the opinion, are accounted for on the supposition that essential oil is the more common principle of odour, and is capable of being volatilized in small quantity at a low temperature, and of thus being diffused through the atmosphere, or communicated to water.

The existence of an acrid principle has been inferred from an acrimony residing in some plants, which they lose on drying, while their other active powers remain; and from this acrimony being in some cases transferred to water or alcohol by distillation. It is not very certain, however, if this quality is not in such cases connected with some of the known proximate principles; nor has this acrid principle, if it do exist, been obtained so as to submit it to chemical examination.

A principle has been supposed to exist in some of the vegetable bitters in which their bitterness resides. It is obvious, however, that the quality of bitterness may belong to any of the known proximate principles; and the qualities which have been assigned to this principle as it exists in some vegetables, particularly in gentian or quassia, such as equal solubility in water, and in alcohol, and being precipitated by certain re-agents, rather prove it in these cases at least to be a variety of extractive matter.

A narcotic principle has been supposed to exist, from the narcotic power of some vegetables being impaired by age, without any apparent loss of matter, and from its being rendered inert by decoction, though no volatile matter is collected possessed of the quality. But such facts are rather favourable to the conclusion, that the loss of power is owing to chemical changes in one or other of the known principles, probably the extract, in which the narcotic quality may be supposed to reside. In

submitting opium to analysis, it has been affirmed, that a crystaline matter is obtained, which proves narcotic, and has been supposed to be the principle on which that quality possessed by the opium depends. But it does not, admitting its existence, appear to be possessed of the narcotic property in that high degree we should expect, were it the principle on which that property is dependent, nor is there any proof that it exists in any other narcotic.

The existence of all these principles, therefore, is extremely problematical; and the qualities assigned to them may, with much more probability, be referred to modifications of composition in the known principles, which are probably too subtle to be ever determined by chemical analysis.

Alcohol, and the *Ethers* formed from it by the action of acids, cannot be regarded as vegetable products; yet they have a relation to these, as their chemical constitution is similar, and they cannot be formed but by changes produced in vegetable matter. As important medicinal and pharmaceutic agents, they are entitled to notice.

Alcohol is formed by the process of fermentation from saccharine matter, or from fecula, the latter being previously subjected, partially at least, to the operation of malting, by which it is in fact converted into the former. The fermented liquor being distilled affords the alcohol formed during the process, diluted with water, and with some impregnation of odour from the fermented substance. From this pure alcohol is procured by repeated distillation, the abstraction of the water from it being aided by the action of potash, or rather sub-carbonate of potash.

Alcohol is a colourless transparent fluid, having a specific gravity, according to its state of concentration, from 0.835 to 0.800; it is fragrant and pungent, and in its action on the living system possesses a high degree of stimulant and narcotic power; it is volatile, and inflammable, affording, during its combustion, no products but water and carbonic acid, the quantity of water exceeding even the weight of the alcohol. It contains, therefore, much hydrogen in its composition, with which carbon is combined, and perhaps also a portion of oxygen. It combines with water in every proportion, and in consequence of the affinity between these fluids, they mutually

precipitate substances which either has dissolved, that are insoluble in the other. It is decomposed by the acids, affording, as the principal product, the different ethers. As a pharmaceutic agent, it is of much importance from the solvent power it exerts on a number of the vegetable proximate principles.—essential oil, camphor, extract, and others, and by its property too of counteracting the spontaneous changes to which vegetable matter is liable.

Ether. The name Ether is given to a peculiar product obtained by the action of the more powerful acids on alcohol, the product differing in its properties according to the acid employed in its formation, but in general being extremely light, volatile, and inflammable. Sulphuric ether, formed by the action of sulphuric acid on alcohol, has a specific gravity not greater, when it is pure, than 0.716; it is so volatile as to evaporate rapidly at the common temperature of the atmosphere; in burning it affords water and carbonic acid: its odour is fragrant and penetrating; its taste pungent; it is soluble in water only in limited proportion, about one part in ten. It exerts on the vegetable principles the same solvent action nearly as alcohol, except on extract, which it has been said to precipitate,—an effect, however, I have not been able to obtain from it. Nitric ether is equally light and even more volatile; it is inflammable; it is soluble in water in limited quantity, but combines with alcohol in every proportion: its odour is strong and penetrating. Muriatic ether is more volatile than either, existing in the state of gas, under the atmospheric pressure, at 60°; at 50 it becomes liquid, and its specific gravity is not less than 0.874; it is transparent, colourless, odorous, and pungent. Acetic ether is moderately light, volatile, and inflammable, soluble in water in limited quantity, and has no odour etherial, but approaching also to that of vinegar. All these ethers appear to differ from alcohol, principally in having a larger proportion of hydrogen in their composition, to which probably their greater levity and volatility are to be ascribed; and they generally contain a portion of the acid by the action of which they have been formed, which, in some of them at least, appears essential to their chemical constitution.

Having pointed out the distinguishing properties, and the general pharmaceutic relations of the proximate prin-

ciples of vegetables, it may be proposed as a question important in relation to the object of the present outline. Do these principles usually exist in the vegetable in a state of chemical combination, whence some modification of their powers might result, or are they more generally mechanically mixed?

The latter appears to be generally the case. These principles can often be observed existing apart from each other, and even placed in separate vesicles. They can in many cases be separated by mechanical means; and even where they are more intimately mixed, that change of properties does not take place, which we must have expected were they chemically united, the virtues of each principle being discernible in the entire mixture, weakened, but not changed. It seems to follow, therefore, that the virtues of vegetable substances do not depend on chemical combinations of their proximate principles, but rather on the peculiar ultimate composition of one or other of these principles. Hence also it is evident, that in separating the proximate principle of any vegetable, we cannot expect to alter or improve its virtues, farther than in concentrating them by a separation from what is inert, or in separating principles which are possessed of different or even opposite powers. The attainment of these ends, however is, in innumerable cases, of importance in their exhibition as medicines.

From this enumeration of the Proximate Principles of Vegetables, we may perceive the reasons for those pharmaceutic processes to which plants are usually subjected.

Vegetable matter being liable to decomposition when in a humid state, from the re-action of its elements and their entering into new combinations, exsiccation is an operation to which they are generally subjected, to preserve them without injury. It is performed either by the action of a current of air, or by exposure to heat, care being taken that the heat shall not be such as to dissipate any of their volatile principles, or cause any chemical change.

By infusion in water, the fluid is impregnated with the gum, sugar, extract, tannin, saline substances, part of the essential oil, and part also of the resinous principle. The aroma of the plant is generally first taken up: by longer infusion the water is loaded with the colouring, astringent, and gummy parts: these are also most abun-

dantly dissolved when the temperature is high. Hence an infusion differs according as the water has stood longer or shorter on the materials, and according as it has been promoted or not by heat. An infusion made in the cold is in general more grateful, while one made with heat, or by keeping the fluid long upon the materials, is more strongly impregnated with active matter.

By decoction or boiling, the solvent power of the water is still farther increased; and hence the liquor always appears darker coloured, and is, in fact, more loaded with the principles of the vegetable which it can hold dissolved. The volatile parts, however, particularly the essential oil, are entirely dissipated; and therefore it is an improper process for those vegetables whose virtues depend, wholly or partially, on these parts. Even the fixed principles of vegetables, at least some of them, are injured, by long decoction. The extractive matter, for instance, gradually absorbs oxygen from the atmosphere, and is converted into a substance nearly insipid and inert. Opium, Peruvian bark, and many other vegetables, are injured in this manner by decoction, especially if the atmospheric air is freely admitted; and these two circumstances, the dissipation of the volatile matter, and the oxygenation of the extractive, considerably limit the application of this process. It is still used, however, with advantage, to extract the mucilaginous parts of vegetables, their bitterness, and several others of their peculiar qualities.

Alcohol may be applied to vegetables to extract those principles which are not soluble in water. It dissolves entirely their essential oil, camphor, and resin; and as these are often the parts on which the virtues of vegetables depend, these solutions, or tinctures as they are termed, are often active preparations.

Equal parts of alcohol and water, in general, extract still more completely the active matter of plants, as we thus obtain a solution of all those substances which are separately soluble in either of these fluids.

When by the action of one or both of these fluids we obtain a solution of the active principles of a vegetable, the solution may be evaporated to the consistence of a thick tenacious mass. This forms what is termed an extract: it is named an aqueous extract when obtained from the aqueous infusion or decoction of a plant, and spiritous when alcohol has been the solvent. The design

of this preparation is to obtain the active matter of the vegetable in a small bulk, and in such a state that it may be preserved a long time without suffering any alteration. It is evident, that it is a process which can be properly applied to such plants only as have their virtues dependent on some of their fixed principles, and even these are often injured by the heat applied, and the free access of the atmospheric air.

Distillation is another process applied to vegetable substances, by which we obtain some of their active principles, particularly their essential oil. If the vegetable matter be heated with a large portion of water, the oil is volatilized with the aqueous vapour: it separates from the water on being allowed to remain at rest; a part of it, however, is also dissolved, and communicates to the water a considerable degree of flavour, and often also of pungency. This forms what are named distilled waters. If alcohol be used instead of water, the essential oil is completely dissolved in it, and we thus obtain what are termed distilled spirits.

By such processes we extract the active matter of vegetables from the inert matter with which it is more or less mixed, and are enabled to administer many remedies under a variety of forms, suited to particular circumstances. A single example will shew the utility of investigations of this kind, respecting the component principles of vegetable products, and their relations to the more important chemical agents. Peruvian bark is one of the most important remedies in the Materia Medica. Practitioners have not always found it practicable to exhibit it in substance with advantage, as where the stomach is uncommonly irritable, or where from the nature of the disease, it is necessary to give it in large doses, frequently repeated, it is apt to occasion sickness and other uneasy sensations, and even to be rejected by vomiting. Such inconveniences are attempted to be obviated, by giving it in the different forms of infusion, decoction, tincture, or extract, as any of these may be best suited to the case. Our knowledge of its constituent parts can only lead us to the proper application of these processes. From an accurate analysis of this bark, it has been proved that seven parts out of eight consist of woody fibre, or of a matter inert and insoluble, which cannot act on the system, and which affects the stomach only by its weight and

insolubility. The remaining eighth part is that in which the activity of the medicine resides; it is therefore evident that if this be extracted, without injuring its activity, the medicine could be exhibited with much more advantage. This is in part accomplished by the preparations of it that have been mentioned; but even these do not convey it in all its force. If one ounce of the bark be infused or boiled in a certain quantity of water, the infusion or decoction is not nearly equal in efficacy to the whole quantity of bark operated on. It is therefore evident, that during either of these operations, the active matter of the bark has not been entirely extracted, or has suffered some change. And here chemistry lends her assistance, and still farther elucidates the peculiar nature of this substance, and the changes produced in it by these processes. It has been proved by experiment, that the matter on which the power of the bark depends, has a strong attraction for oxygen at a temperature moderately increased; that during the infusion and particularly during the decoction of that drug, this active matter absorbs oxygen from the atmosphere, and is converted into a substance insipid and inert. This leads to the improvement of the preparations of this medicine; and experiments instituted for the purpose have accordingly proved, that, while by long boiling the virtues of the bark are nearly totally destroyed, they are fully extracted by a few minutes decoction in covered vessels. The same investigations have pointed out the nature of the action of some other substances on bark, formerly not well understood. Thus, it has been found by experience, that the alkalis, and more particularly magnesia, enable water to extract the virtues of bark, more completely by infusion.—a circumstance elucidated by the fact since discovered, that the extractive matter of the bark, to which its activity is owing, combines with facility with these substances, and forms soluble compounds.

Similar examples might be given from several other important vegetable remedies, which would sufficiently prove the utility to be derived from the analysis of the substances belonging to the vegetable kingdom, and that indeed researches of this kind are absolutely necessary for their proper preparation as medicines.

The account of the analysis of animal substances, and of their proximate principles, would, to the same extent at least, be foreign to the objects of this sketch, as so few of these substances are employed in medicine; and of those which are used, the composition, and consequently the pharmaceutic treatment, are in a great measure peculiar to each.

Their general chemical characters are similar to those of vegetable principles.—Composed of a few ultimate elements, the differences in their properties arise in a great measure from the different proportions, or the different modes in which these are combined. And these elements having powerful reciprocal attractions, and being disposed to enter into combinations almost indefinitely diversified with regard to these circumstances, these substances are extremely susceptible of decomposition, from the reaction of their elements, favoured by humidity, by the action of the air, or by elevation of temperature. They are even more liable to this than vegetable substances; for their elements existing in simultaneous combination are more numerous, their affinities are therefore more nicely adjusted, and of course the equilibrium is more easily subverted.

Along with carbon, hydrogen, and oxygen, which are the chief constituent principles of vegetable matter, nitrogen, and frequently sulphur and phosphorus enter into the composition of animal substances. Hence, when decomposed by heat, they afford products composed of these, of which ammonia is always the principal; and the reaction of these principles, and the evolution of the products arising from this, seem principally to form the series of changes which constitute putrefaction, the species of spontaneous decomposition to which animal matter is more peculiarly subject.

Like vegetable substances, the animal products consist of various proximate principles, and some analogy may be traced between several of the vegetable and animal proximate principles. Animal fat has a strict connection in properties and composition with fixed oil; animal mucus resembles vegetable mucilage; fecula has a similar relation to gelatin; vegetable and animal gluten are nearly if not entirely the same; a substance similar to saccharine matter exists in milk, and in some of the other

animal secretions: in the bile is found a principle strictly analogous to resin; and benzoic, oxalic and acetic acids are common to both. Hence, generally speaking, the few animal substances belonging to the Materia Medica are acted on by the usual solvents in nearly the same manner as vegetable substances, and are submitted to similar pharmaceutic processes. The results of these are similar officinal preparations. Thus, by the action of alcohol, the active matter of musk, castor, and cantharides is extracted, and tinctures of these are employed. In other cases water is the proper solvent, particularly of those which consist of gelatin; but such solutions being very liable to decomposition, must always be of extemporaneous preparation.

SECTION II.

Of the Pharmaceutical operations to which the articles of the Materia Medica are subjected.

Natural substances, it has been remarked, are not always obtained in that state in which they are best adapted to exhibition as remedies. They are subjected, therefore, to various processes, with the view of preserving them, or of preparing them for use; and to complete this statement of the principles of pharmaceutic chemistry, the nature of these is to be pointed out.

These processes, or at least the greater number, and the most important of them, are chemical, and are dependent therefore on the agencies of those general forces whence chemical changes arise; they are indeed little more than applications of these, under peculiar regulations adapted to different substances. The general facts, therefore, connected with the operation of these forces are first to be stated, in so far as they have any relation to the present subject.

The force principally productive of chemical action, is that species of attraction exerted between the particles of bodies, which brings them into intimate union. If two substances of different kinds be placed in contact, and with that degree of fluidity which admits of the particles of the one moving to those of the other, it often happens that they unite together, and form a substance

in which neither can be any longer recognised, and which is homogeneous, and in general possessed of new properties. This constitutes what, in the language of chemistry, is named combination, and is conceived to arise from an attraction exerted between the particles of the one body to those of the other. It is this which is denominated chemical attraction or affinity, and which is distinguished from the other species of attraction by the phenomena to which it gives rise, or by the laws it obeys,—from the attraction of gravitation, by not being exerted at sensible distances, or on masses of matter, but only at insensible distances, and on the minute particles of bodies,—from the attraction of aggregation, by being exerted between particles of different kinds, and forming a substance with new properties, while that force operates on particles of a similar nature, and of course unites them into an aggregate in which the same essential properties exist. It is possible that these forces, though thus distinguished, may be the result of the same power modified by the circumstances under which it acts.

The substance formed by chemical combination is named a compound. The substances united are the constituent or component parts or principles of the compound. When these are separated, the process is named decomposition. The most minute parts into which a body can be resolved without decomposition are named its integrant parts; and it is between these that the force of aggregation is conceived to be exerted. Chemical attraction is exerted between the constituent parts.

The most important phenomena attending chemical combination is a change of properties. In general, the form, density, colour, taste, and other sensible qualities, as well as the fusibility, volatility, tendency to combination, and other chemical properties in the compound are more or less different from what they are in either of its constituent parts, and frequently indeed they are wholly dissimilar. There are cases, too, however, where the change is less considerable, as is exemplified in several of the operations of Pharmacy,—the solution of the vegetable proximate principles in water or in alcohol, or the solution of salts in water, in which the body acquires merely the liquid form, with perhaps a slight change of density, but in which no important property is changed, nor any new one acquired.

Chemical attraction is not an invariable force exerted by every body to every other, and always with the same degree of strength. Between many substances, it does not sensibly operate, though this perhaps may be owing to the predominance of external circumstances, by which its operation is influenced, rather than to the absence of all mutual attraction. It is exerted too by each body towards others, with different degrees of strength.

It is not limited in its action to two bodies, but is frequently exerted at the same time between three, four, or a greater number, so as to unite them in one combination. Such compounds are named Ternary, &c. according to the number of their constituent principles; they are abundant among the productions of nature, and can be formed also by the arrangements of art.

This force is exerted too, so as to combine bodies in more than one proportion; and, from the union of two substances in different proportions, compounds are formed frequently as dissimilar in their properties as if they were composed of principles totally different. In some cases, the combination is unlimited with regard to proportions, in others, it is fixed to two or three relative quantities, and there are examples where it can be established in only one proportion. The opinion has been maintained, and is probably just, that the tendency of chemical attraction is to unite bodies indefinitely with regard to proportion, and that determinate proportions are established only by the operation of external forces.

The compounds formed by the exertion of chemical attraction have apparently the same relation to this power as simple bodies have: they have a similar tendency to combination, unite in different proportions, and with different degrees of force; and all these combinations are accompanied by the same phenomena, and appear to observe the same laws. It has been supposed, however, that when compound substances combine together, the combination is the result, not of the mutual attraction between the integrant particles of these compounds, but of the affinities of their ultimate elements modified by the condition in which they exist.

In all cases attraction is much modified, and its results determined by circumstances foreign to the attractive force itself. The operation of these circumstances has been established with more precision by the labours of

Berthollet, and been proved to be more important than was formerly believed. They require, therefore, more distinct enumeration, especially as some of them give rise to important results in the processes of pharmacy.

1st. Quantity of matter influences affinity, an increase in the relative quantity of one body with regard to another enabling it to act with more force; or, as the law has been stated, "every substance having a tendency to enter into combination, acts in the ratio of its affinity and its quantity." Hence an effect can be produced from the mutual action of two bodies, when one is in a certain relative proportion to the other, which will not be obtained when the proportion is changed,—a circumstance of much importance in pharmacy, requiring, in particular, attention towards insuring the uniform strength of active preparations; and of much influence too on the results of chemical decomposition, rendering it frequently partial, where it was supposed to be complete.

2nd. *Cohesion*, or the state of a body with regard to the aggregation of its integrant particles, must obviously modify the chemical action of another body upon it, by opposing a resistance which must be overcome before the union of their particles can be effected; hence the cause, that two solid bodies seldom act chemically on each other, and that fluidity promotes chemical action. But besides this obvious effect, cohesion, even when it has been overcome, still modifies the exertion of chemical attraction, by resuming its force whenever the force of that attraction is diminished, and thus sometimes giving rise to new combinations; and sometimes too, when suddenly established in consequence of the affinities becoming effective, it determines the proportions in which bodies combine, by insulating the compound at a certain stage of the combination. It is thus the most powerful cause in placing limits to the exertion of chemical attraction. Insolubility, is merely the result of the force of cohesion, in relation to the liquid which is the medium of chemical action, and its action is of course similar; and great density, or specific gravity, so far as it influences attraction, operates in nearly the same manner, counteracting it, by withdrawing the substances between which it is to be exerted from the sphere of mutual action.

3d. *Elasticity*, or that property of bodies arising from repulsion between their particles, and present to any extent

only in those existing in the aeriform state, opposes the exertion of chemical attraction, by enlarging the distances at which these particles are placed. Hence aerial fluids combine in general with difficulty; and hence too, a compound which contains an ingredient which, when insulated, assumes the aerial state, is more easy of decomposition, and the decomposition is more complete, than a compound, the ingredients of which are fixed; for the tendency to elasticity in the volatile ingredient counteracts the mutual affinity; and when by the application of heat, or the operation of a superior attraction, any portion of it is displaced, by assuming the elastic form it is withdrawn from the sphere of action, and ceases to oppose any obstacle by its affinity or quantity to the progress of the decomposition. Elasticity too, by counteracting attraction, places limits to the proportions in which bodies combine.

4th. The last circumstance influencing attraction is temperature, or the state of a body with regard to heat or cold, which sometimes favours, and in other cases subverts combination. The cause of temperature is a peculiar subtle power or principle, (in modern chemical language denominated caloric,) capable of being communicated to bodies, and of being in part at least withdrawn from them. Its immediate tendency is to establish a repulsion between their particles; hence it gives rise to expansion or enlargement of volume, greater in each body according to the quantity of caloric introduced. This progressive augmentation of distance, at which the particles are placed by its action, is accompanied with a proportional diminution in the force of cohesion; if carried, therefore, to a certain extent, that force is so far modified, that the particles become capable of moving easily with regard to each other,—a state which constitutes fluidity; and, if the communication of caloric be continued, the expansion still continuing, the particles are at length placed at such distances, that the attraction is entirely overcome, and they repel each other,—a state which constitutes the aerial or gaseous form. The operation of caloric in influencing chemical attraction, appears to depend on the changes it occasions in the cohesion and elasticity of bodies,—favouring combination by diminishing cohesion, counteracting or subverting it by communicating or increasing elasticity; these effects too being often produced together, and modifying each other.

From the difference of the forces of affinity among bodies, or still more perhaps from the operation of those circumstances by which affinity is modified, its power is often suspended or overcome, and substances which have been combined are separated. This forms what in chemistry is named decomposition, and it presents results equally important with those from combination.

The decomposition may be simple, that is, a compound may be resolved into its constituent parts, each of which is insulated. This is in general effected by the agency of heat. Within a certain range of temperature, the affinity which has combined two bodies continues to operate; but when the temperature is raised, and when the bodies differ in their volatility, or the tendency they have to assume the elastic form, the elasticity of the more volatile one is so far favoured by the elevated temperature, that the mutual affinity is overcome, and it is disengaged. It is generally obtained pure; but the fixed substance, from the influence of quantity on chemical attraction, frequently retains a portion of the other combined with it.

Decomposition is more complicated when it is produced by the introduction of a third substance, which exerts an attraction to one of the ingredients of a compound. When this is effective, the body added combines with this ingredient, forming a new compound, and it is only the other ingredient of the original compound that is obtained insulated. A case still more complicated is, where two compound substances are brought to act on each other, and the principles of the one exert affinity to those of the other; so that an interchange takes place, the two compounds are decomposed, and two new ones are formed. Both these kinds of decomposition are likewise materially modified by the state with regard to temperature. The former case used to be named by chemists single elective attraction; the latter double elective attraction; and both were considered as the results of the relative forces of attraction among the bodies concerned. But there is reason to believe that they arise from the operation of cohesion, elasticity, and the other forces that influence attraction; and that but for the operation of these forces, three or more bodies presented to each other would enter into simultaneous union, instead of passing into binary combinations.

Galvanism, as well as caloric, influences chemical affini-

ty, and by the attractive as well as by the repulsive force it exerts is even more powerful in producing decomposition. It scarcely admits, however, of being applied to any pharmaceutic process.

The operations of pharmacy are generally dependent on these chemical powers; they consist of arrangements of circumstances with the view either of promoting their exertion or of obtaining the products of chemical action.

Some preliminary operations are frequently had recourse to of a mechanical nature, to diminish the cohesion of bodies, or enlarge their surface. Such are pulverization, trituration, levigation, granulation, &c.

Pulverization is the term employed where solid bodies are reduced to powder by beating. Trituration that where the same effect is produced by continued rubbing. Levigation denotes the operation where the powder is rubbed to a still greater fineness, the rubbing being facilitated by the interposition of a fluid, in which the solid is not soluble. As by any of these operations, the powder must consist of particles of unequal size, the finer are separated from the coarser by sifting or washing. Sifting is passing the powder over a sieve, the interstices of which are so minute as to allow only the finer particles to pass. Washing or Elutriation, is an operation performed only on substances which are not soluble in water. The powder is diffused through a quantity of that fluid, and the mixture is allowed to remain at rest. The coarser particles quickly subside, and the finer remain suspended. It is then decanted off, the powder is allowed to subside, and is afterwards dried. These methods of reducing bodies to powder, can be applied to very few of the metals, their force of cohesion being too strong. They are mechanically divided by rasping, or by being beat into leaves: or they are granulated,—an operation performed by melting the metal, and when it is cooled down as far as it can be, without becoming solid, pouring it into water: it passes to the solid state, assuming the granular form.

In pharmacy, these operations are sometimes of importance, besides merely promoting chemical combination, as there are some medicines which act with more certainty, and even with more efficacy, when finely levigated, than when given in a coarse powder.

As means of promoting chemical combination, it is

evident, that they can act only indirectly; the bodies being far from being reduced to their minute particles, between which only chemical attraction is exerted. They are therefore employed, merely as preliminary to those operations in which such a division is obtained by chemical means.

Of these, the first is solution. By this is understood that operation in which a solid body combines with a fluid in such a manner that the compound retains the fluid form, and is transparent. Transparency is the test of perfect solution. When the specific gravity of a solid body differs not greatly from that of a fluid, it may be diffused through it, but the mixture is more or less opaque; and on being kept for some time at rest, the heavier body subsides; while in solution the particles of the solid are permanently suspended by the state of combination in which they exist, and are so minute as not to impair the transparency of the liquid.

The liquid has, in this case, been regarded as the body exerting the active power, and has been named the solvent or menstruum; the solid is considered as the body dissolved. The attraction, however, whence the solution proceeds, is reciprocal, and the form generally proceeds from the larger quantity of the liquid employed, and from the absence of cohesion being more favourable to the combination proceeding to a greater extent.

In general, the solution of a solid in a liquid can be effected only in a certain quantity. This limitation of solution is named saturation; and when the point is reached, the liquid is said to be saturated with the solid. As the fluid approaches to saturation, the solution proceeds more slowly. When a fluid is saturated with one body, this does not prevent its dissolving a portion of another; and in this way three, four, or five bodies may be retained in solution at the same time by one fluid. In these cases, the fluid does not dissolve so large a proportion of any of these substances, as if it had been perfectly pure, though sometimes the whole proportion of solid matter dissolved is increased from the mutual affinities the bodies exert. Neither is the solvent power always thus limited, there being many cases where a solid may be dissolved in a fluid to any extent. Gum or sugar, for example will dissolve in water, and form a perfect solution in every proportion.

An increase of temperature, in general, favours solution, the solution proceeding more rapidly at a high than at a low temperature; and in those cases, in which a certain quantity only of the solid can be combined with the fluid, a larger quantity is taken up when the temperature is increased. The quantity dissolved is not in every case promoted alike by an increase of temperature; water, for example, having its solvent power, with regard to nitre, greatly increased by augmentation of temperature, while sea salt is dissolved in nearly as great a quantity by water at a low as at a high temperature. This difference in these salts, and in many others, depends on the difference in the degree of their fusibility by heat; those which are most easily fused having their solubility in water most largely increased by increase of temperature. All these facts, indeed, with regard to solution, are explained, by considering this operation as depending on chemical affinity overcoming cohesion in the body dissolved.

Agitation favours solution, by bringing successively the different parts of the liquid into contact with the solid, and thus preventing the diminished effect which arises from the approach to saturation in the portion immediately covering the solid. The mechanical division of a solid too, is favourable to its solution, principally by enlarging the surface which is acted on.

Solution is an operation frequently had recourse to in pharmaceutical chemistry, the active principles of many bodies being dissolved by their proper solvents. Salts are dissolved in water, as are also gum, extract, and other vegetable products. Products of a different kind, as resin, camphor, and essential oils, are dissolved in alcohol and wine; and metals are rendered soluble and active by the different acids. Solutions in water, alcohol, or wine, possess the sensible qualities and medical virtues of the substance dissolved. Acid and alkaline liquors change the properties of the bodies which they dissolve. In Pharmacy, the operation receives different appellations, according to the nature of the solvent, of the substance dissolved, and of the manner in which it is performed. When a fluid is poured on any vegetable matter, so as to dissolve only some of its principles, the operation is named *Extraction*, and the part dissolved is said to be extracted. If it is performed without heat, it

is termed *Maceration;* if with a moderate heat, *Digestion;* if the fluid is poured boiling hot on the substance, and they are kept in a covered vessel till cold, this is denominated *Infusion*. *Decoction* is the term given to the operation when the substances are boiled together. It is evident, that these are all instances of solution, varied only by particular circumstances; and I have already stated, under the analysis of the vegetable part of the materia medica, the advantages belonging to each. Lixiviation is the term applied to solution performed on saline substances where the soluble matter is separated, by the action of the solvent, from other substances that are insoluble; and the solution obtained in this case is named a ley.

The other principal method by which that fluidity necessary to chemical action is communicated, is fusion. It requires, merely with regard to each substance, the necessary degree of heat; and where this is high, it is performed usually in crucibles of earthern ware, or sometimes of black lead, or on a large scale in iron pots.

Chemical combination is frequently promoted by an elevation of temperature, though the heat may not be so high as to produce fusion, but only to diminish cohesion to a certain extent. Calcination, as it used to be named, or metallic oxidation, is an example of this; a metal being heated to a high temperature, so as to enable it to combine with the oxygen of the air. Deflagration is a similar operation, an inflammable or metallic substance being exposed to a red heat in mixture with nitre: the acid of the nitre yields its oxygen; which being thus afforded in large quantity and nearly pure, the oxidation takes place with rapidity, and generally to its *maximum*.

When chemical action has been exerted, other operations are sometimes required to obtain the product, or sometimes this product is formed and collected in the operation itself.

By evaporation, or dissipating a liquid by the application of heat, a solid substance which has been dissolved in it is recovered, and this operation is one frequently performed in pharmacy. When performed on a small scale, vessels of glass, or of earthern ware, are generally employed, and the heat is applied either by the medium of sand, or if it is required to be more moderate, the vessel is placed over water which is kept boiling, forming what is named the water bath, or *Balneum Mariæ*. When

performed on a larger scale, shallow iron pots or leaden troughs are used, to which the fire is directly applied; and experiments have shewn that the operation is conducted more economically when the liquor is kept boiling strongly than when it is evaporated more slowly by a more gentle heat. There is, on the other hand, however, some loss, from part of the dissolved substance being carried off when the heat is high, by its affinity to the liquid evaporating; and in many cases in pharmacy, particularly in the evaporation of vegetable infusions or tinctures, the flavour, and even the more active qualities of the dissolved substance, are liable to be injured, especially towards the end of the operation, by a strong heat.

When the object is to obtain the volatile matter by evaporation, the process is of course conducted in close vessels adapted to condense the vapour and collect the liquid. This forms the operation of distillation, which, with regard to different substances, requires to be conducted in various modes.

When a volatile principle is to be obtained from vegetable substances by this process, the difficulty is to apply the heat sufficiently without raising it too high. The mode generally employed is to heat the vegetable matter with water, and the distillation is then usually performed in the common still. At the heat of boiling water, the essential oil of plants, which is the chief volatile principle they contain, is volatilized; it rises with the watery vapour; is condensed; if little water has been employed, the greater part of the oil is obtained apart; if much has been used, it retains it dissolved, acquiring taste and flavour, and thus forming the distilled water of plants. If alcohol, pure or diluted, has been the medium of distillation, it always retains the oil in solution, and forms what are named distilled spirits. The still in which the operation is performed with these views is of copper, or iron; it consists of a body and head, the former designed to contain the materials, and to which the fire is applied, the latter to receive the vapour; there issues from it a tube, which is connected with a spiral tube, placed in a vessel, named the refrigeratory, filled with cold water. The vapour, in its progress through the tube, is condensed, and the liquid drops from the extremity of it.

When metallic matter would be acted on, by the materials or the product of distillation, vessels of glass or

earthen ware are employed; the retort, which is generally used, being connected with a single receiver, or with a range of receivers, according as the vapour is more or less easily condensed; or, if the product is a permanently elastic fluid, which cannot be condensed but by passing it through water, a series of bottles connected by tubes, on the principle of Woolf's apparatus, is used. When the product obtained by distillation is not perfectly pure, it can be frequently purified by a second distillation; the process is then named *Rectification:* when it is freed from any superfluous water combined with it, the operation is named *Dephlegmation* or *Concentration.*

When the product of volatilization is condensed, not in the liquid, but in the solid form, the process is named Sublimation, and the product a Sublimate. As the condensation takes place with much more facility, a more simple apparatus is employed, consisting usually of a conical bottle or flask with a round bottom, thin and equal, named a cucurbit, in which the materials are contained, heat being applied by the medium of a sand bath. The vapour condenses in the upper part of the flask forming a cake, which adheres to it, the orifice being lightly closed to prevent any part from being lost; or a globular head, with a groove at its under edge, and a tube to convey off any liquid that may be condensed, (a capital as it is named,) being applied.

When a solid substance is thrown down from a liquid by chemical action, it forms the operation of precipitation, and the matter thrown down is named a precipitate. Frequently the substance precipitated is one which had been dissolved in the liquid, and which is separated by a substance added, combining with the liquid, and weakening its attraction to the one which it held in solution. Or sometimes it arises from a compound being formed by the union of one body with another, which is insoluble in the liquid that is the medium of action. The precipitate is allowed to subside, is usually washed with water, and is dried. From the law of chemical attraction, that quantity influences the force of affinity, it often happens that the precipitate either retains in combination a portion of the substance by which it had been dissolved, or attracts a portion of the substance by which it is thrown down, and this sometimes proves a source of impurity, or of peculiar powers in medicinal preparations.

When a substance, in passing to the solid state, assumes a regular geometric form, the process is named crystalization, and these figured masses are denominated crystals. Their forms are various, though nearly constant with regard to each substance; they are usually transparent, hard, and have a regular internal structure. The crystalization may happen in two ways, from a state of solution. If a saturated solution has been prepared with the aid of heat, the increased quantity of the solid which the heat has enabled the liquid to dissolve, separates as the temperature falls; and the attraction of cohesion being thus slowly exerted between the particles, unites them so as to form crystals. Or, if a portion of the solvent be withdrawn by evaporation, and especially by slow evaporation, the particles of the solid unite slowly, and with a similar result.

In both these kinds of crystalization from a watery solution, the crystalized substance always retains a quantity of water, and frequently even a considerable proportion in its composition. It is essential to the constitution of the crystal, its transparency, structure and form, and is hence named the water of crystalization. Some crystals lose it from mere exposure to the air, when they are said to effloresce; others attract water, and become humid, or deliquesce.

Crystalization is promoted by the mechanical action of the air; likewise by affording a nucleus, whence it may commence, and especially a crystal of the substance dissolved; and with regard to a few substances, their affinity to the solvent requires to be diminished by the addition of another substance to enable them to crystalize.

In pharmacy, crystalization is of importance, by enabling us to obtain substances, especially those belonging to the class of salts, in a pure form; different salts, even when present in the same solution, being thus separated by their different tendencies to crystalization, according as they are more or less soluble in the solvent, or have their solubility more or less promoted by heat, and each salt, when it does crystalize, being in general pure.

These are the principal operations of pharmacy. Connected with this subject, there remain to be noticed the weights and measures which are usually employed. The division according to what is named troy weight is that

ordered in the pharmacopœias. Its parts, with the symbols by which they are denoted, and their relative proportions, are represented in the following table:

A pound (libra),	℔	contains	12 ounces.
An ounce (uncia),	℥		8 drachms.
A drachm (drachma),	ʒ		3 scruples.
A scruple (scrupulus),	℈		20 grains (grana) gr.

Measures have been subdivided in a similar manner, being made to correspond to the specific gravity of water. As the specific gravities of liquids vary, however considerably, a source of error is introduced in applying the standard measure to different liquids, unless the due allowance be made for the difference in specific gravity. This it is to be presumed will often be neglected, and hence the Edinburgh college have rejected the use of measures, and given the proportions of every liquid by weight. The use of measures, however, in apportioning liquids, being more easy and convenient, will probably always be retained; and the London college have therefore, in the late edition of their pharmacopœa, sanctioned their use. They adopt measures subdivided from the wine gallon, as represented with their symbols in the following table:

A gallon (congius),		contains	8 pints.
A pint (octarius),	O		16 fluidounces.
A fluidounce (fluiduncia),	f ℥		8 fluidrachms.
A fluidrachm (fluidrachma),	f ʒ		60minims (minima.) ♏.

This last measure is one newly introduced. In apportioning liquids into very small quantities, the quantity has been usually estimated by drops (gutta, gtt.) allowed to fall from the edge of the mouth of a bottle; but the size of the drop is liable to vary much, not only according to the mobility and specific gravity of the liquid, a circumstance of little importance, since with regard to each substance it remains the same, but also according to the thickness of the edge and degree of inclination. The London College have therefore substituted this division of *minims*, which are measured in a slender graduated glass tube. The measure of a table and of a tea spoon-

ful are sometimes used in extemporaneous prescription, and though not very accurate, may be admitted where a small difference in the dose is not important. The one is understood to be equal to half an ounce by measure, the other to about one drachm.

The following characters are also in general use.

℞ Recipe, *Take.*
ā āā. ana, *of each.*
ʒ ss. *the half of any thing.*
Cong. Congius, *a gallon.*
Cochl. Cochleare, *a spoonful.*

PART II.

MATERIA MEDICA.

The Materia Medica comprehends all those substances whether natural or artificial, which are employed as remedies; and in the Pharmacopœias lately published by the colleges of London, Dublin, and Edinburgh, the simple articles composing the catalogue are arranged in alphabetical order, and the same plan is also adopted by the Massachusetts Medical Society in their Pharmacopœia. In the very respectable and learned production of which the preceding pages are a part, Mr. Murray has exhibited a new classification: it seems, however, more eligible to adhere to the system most generally adopted, and to employ that nomenclature, which will also coincide with the plan of the Pharmacopœia which is the basis of this work. A considerable number of unimportant European articles are excluded, and several new indigenous substances introduced; to these is subjoined a short view of the natural, medical, and pharmaceutical history, with the virtues and doses of each. As, however, Murray's medicinal distribution of substances, and explanation of their operations, are the most unexceptionable of any that have hitherto appeared, it may be proper to premise his observations relative to a new classification of the articles of the Materia Medica; and his concise view of their operations on the living system.

In explaining the operations of medicines, and classing them according to these operations, it is to be regarded as a first principle, that they act only on the living body. The presence of life is accompanied with peculiar properties, and with modes of action, inexplicable on mere mechanical or chemical principles. Substances acting on the living system no doubt produce effects referrible to these; but the changes they produce are also always so far modified as to be peculiar in themselves, and regulated by laws exclusively belonging to organized matter.

Medicines, in general, operate by stimulating the living fibre, or exciting it to motion. This proposition has even been stated as universal, and was received as an axiom, in a system superior, perhaps, to any, in conveying just and precise ideas on the nature of life, and the affections to which it is subject. Medicines, in common with all external agents, are, according to this system, incapable of directly altering the state of the vital power: they can only excite the parts possessed of that power to action; and however diversified their effects may appear to be, such diversities are to be referred merely to the different degrees of force in which they exert the general stimulant power they possess.

This proposition cannot, however, be received in an unlimited sense. From the exhibition of different medicines, very different effects are produced, which cannot be satisfactorily explained from the cause assigned,—the difference in the *degree* of stimulant operation. They differ in *kind* so far, that even in the greater number of cases, one remedy cannot by any management of dose or administration be made to produce the effects which result from the action of another.

It is therefore necessary to admit some modifications of the general principles above stated, and the following are perhaps sufficient to afford grounds for explaining the operations of remedies, and for establishing a classification of them sufficiently just and comprehensive.

I. Stimulants are not to be regarded as differing merely in the degree of stimulant operation which they exert. An important distinction exists between them, as they are more or less diffusible and permanent in their action. A stimulus is termed diffusible, which, whenever it is applied, or at least in a very short time after, extends its action over the whole system, and quickly produces its full exciting effect. A diffusible stimulus is generally also transient in its action; in other words, the effect, though soon produced, quickly ceases. There are others, on the contrary, which, though equally powerful stimulants, are slow and permanent. These varieties, which are sufficiently established, serve to explain the differences in the powers of a number of the most important medicines; and they lay the foundation for the distinction of two great classes, narcotics and tonics, with their subordinate divisions of antispasmodics and astrin-

gents, both consisting of powerful stimulants; the one diffusible and transient, the other slow and permanent in their operation.

II. There is a difference between stimulants, in their actions being directed to particular parts. Some, when received into the stomach, quickly act upon the general system; others have their action confined to the stomach itself, or, at least, any farther stimulant effect they may occasion is slow and inconsiderable; while a third class consists of those which operate on one part, often without producing any sensible effect on the stomach or general system. Some thus act on the intestinal canal; others on the kidneys, bladder, vessels of the skin, and other parts; the affection they excite in these, being the consequence, not of any stimulant operation equally extended over every part, but of one more particularly determined. This difference in the action of stimuli is the principal foundation of the distinctions of medicines into particular classes. Cathartics, for instance, are those medicines, which, as stimuli, act peculiarly on the intestinal canal: diuretics, those which act on the secreting vessels of the kidneys: emmenagogues, those which act on the uterine system: diaphoretics, those which exert a stimulant action on the vessels of the skin. With these operations, medicines, at the same time, act more or less as general stimulants, by which each individual belonging to any class is thus rendered capable of producing peculiar effects; and many of them, by a peculiarity of constitution in the patient, or from the mode in which they are administered, frequently act on more than one part of the system, by which their effects are still farther diversified. Medicines, when thus determined to particular parts, are sometimes conveyed to these parts in the course of the circulation; more generally their action is extended from the stomach, or part to which they are applied, by the medium of the nervous system.

III. Medicines, besides acting as stimuli, sometimes occasion mechanical or chemical changes in the state of the fluids or solids, by which their action is more or less diversified. These operations of medicines were formerly supposed to be more extensive than they really are; and many absurd explanations were deduced from the supposed changes which the solids and fluids underwent in disease. Though these notions are now exploded, it must still be

admitted that changes of this kind take place in the living system. Chemical changes in particular, there is reason to believe, very frequently modify the actions of remedies; and some very obvious operations of this kind, as well as others of a mechanical nature, serve as distinctions for establishing several particular classes.

These observations point out the principles on which the arrangement of the articles of the Materia Medica, from their medicinal operations, may be established.

Those stimulants, which exert a general action on the system, may first be considered. Of these there are two well marked subdivisions, the diffusible and the permanent; the former corresponding to the usual classes of narcotics and antispasmodics; the latter, including likewise two classes, tonics and astringents. In these there is a gradual transition passing into the one from the other, from the most diffusible and least durable stimulus, to the one most slow and permanent in its action.

The next general division is that comprising local stimulants; such are the classes of emetics, cathartics, emmenagogues, diuretics, diaphoretics, expectorants, sialagogues, errhines, and epispastics. These all occasion evacuation of one kind or another, and their effects are in general to be ascribed, not to any operation exerted on the whole system, but to changes of action induced in particular parts.

After these, those few medicines may be considered whose action is merely mechanical or chemical. To the former belong diluents, demulcents, and emollients. Anthelmintics may perhaps be referred with propriety to the same division. To the latter, or those which act chemically, belong antacids or absorbents, lithontriptics, escharotics, and perhaps refrigerants.

Under these classes may be comprehended all those substances capable of producing salutary changes in the human system. Several classes are indeed excluded which have sometimes been admitted; but these have been rejected, either as not being sufficiently precise or comprehensive, or as being established only on erroneous theory.

The subdivisions of these classes may sometimes be established on the natural affinities existing among the substances arranged under each; on their chemical composition; their resemblance in sensible qualities; or, lastly,

on distinctions in their medicinal virtues, more minute than those which form the characters of the class. In different classes one of these methods will frequently be found preferable to any of the others.

TABLE OF CLASSIFICATION.

A. General stimulants.
- a. Diffusible.
  - Narcotics.
  - Antispasmodics.
- b. Permanent.
  - Tonics.
  - Astringents.

B. Local stimulants.
- Emetics.
- Catharties.
- Emmenagogues.
- Diuretics.
- Diaphoretics.
- Expectorants.
- Sialagogues.
- Errhines.
- Epispastics.

C. Chemical remedies.
- Refrigerants.
- Antacids.
- Lithontripties.
- Escharotics.

D. Mechanical remedies.
- Anthelmintics.
- Demulcents.
- Diluents.
- Emollients.

CLASS I.—NARCOTICS.

This first division of the preceding classification, is that comprehending those stimulants, the action of which is general over the system. The first class of this division comprises those which are highly diffusible, and at the same time transient in their operation. This corresponds with the common class of narcotics or sedatives, usually defined, Such substances as diminish the actions and powers of the system, without occasioning any sensible evacuation. The definition is imperfect, as it does not include that stimulant operation which it is acknowledged they equally produce.

When given in a moderate dose, narcotics excite the functions both of body and mind: the force and frequency of the pulse are increased, muscular action is more vigorous, and hilarity or intoxication are induced. These symptoms, after continuing for some time, are succeeded by those of diminished action: the pulse becomes slower, is full and soft, the body is less sensible to impressions, and less capable of voluntary exertion, and the mind is inactive. This state terminates in sleep. When it ceases, there remains a degree of general debility, marked by sickness, tremor and oppression. By a large dose, debility, without previous excitement, is occasioned, and the consequences of an immoderate quantity are delirium, paralysis, coma, and convulsions, sometimes terminating in death. These are the general effects, considerably diversified, however, as arising from different narcotics, and varied by other circumstances. Habitual use considerably diminishes their power.

These medicines act primarily on the stomach, whence their action is conveyed by nervous communication to the general system. Externally applied, they exert their usual action, though with less force. Directly applied to the muscles of animals, they first stimulate them to contraction, but ultimately exhaust their irritability.

As the medicines belonging to this class diminish the actions of the system, when given even in small doses, their primary operation was generally considered as of a depressing kind; and the stimulant effects which occasionally appeared to be produced by their exhibition, were ascribed to what was termed the re-action of the system, or the exertion of that salutary power supposed to belong to the living body, by which every noxious application is resisted and thrown off. They were therefore considered as *directly* sedative, and *indirectly* stimulant.

Precisely the reverse of this doctrine was likewise advanced. As their exciting effects were those which appeared first, and were succeeded by those of debility, and as the first were produced from a small dose, while the others were occasioned when the dose was comparatively large, these substances were regarded as direct stimulants, capable of exciting the actions of the system; and the symptoms of debility which they so frequently produced, were considered as arising from that exhaustion of power, which, according to a general law of the system,

always follows increased action suddenly raised and not kept up. They were regarded, therefore, as *directly* stimulant, and *indirectly* sedative, and the peculiarities of their action were ascribed to their rapid and transient stimulant operation.

If, in investigating this subject, we merely contrast these two theories, little doubt can remain of the superiority of the latter. The suppositions of there being a power in the living system, fitted to resist any noxious agent, and of such a power acting before the deleterious effects have taken place, and thus retarding or preventing their production, are improbable and unsupported by any satisfactory proof. Since the stimulant operation of narcotics always precedes the symptoms of languor and debility which they produce; it is the direct conclusion, that these latter are the consequences of the former. The analogy between narcotics and other substances, admitted to be stimulants, but which are less rapid in their operation, is also in many respects so direct, as to prove similarity of action. And their utility in several diseases, in which they are employed as stimulants, is scarcely consistent with the opinion, that they possess a real depressing power. Some doubt, however, is still attached to the theory that they are direct stimulants, from the fact, undoubtedly true, that the sedative effects of narcotics are frequently disproportioned to their previous stimulant operation, allowing even in such cases, for its rapidity and little permanence; and the proposition, though apparently somewhat paradoxical, is perhaps just, that these substances are at once capable of stimulating the living fibre, and, independent of that stimulant operation, exhaust to a greater or less extent, by *direct* operation, the living power. The effects of certain chemical agents on the living system, as lately ascertained, appear to support some conclusion of this kind.

Narcotics being capable of producing either stimulant or sedative effects, may be practically employed with very different intentions. Either operation is obtained chiefly by certain modes of administration. If given in small doses, frequently repeated, the actions of the system are excited, and kept up. But if given in larger doses, at distant intervals, the state of diminished action and lessened sensibility is obtained. As stimulants, they are employed in various diseases of debility; in intermittent

fever, and continued fevers of the typhoid type; in gout, hysteria, &c. As sedatives, they are used to allay pain and irritation, to procure sleep, and diminish secretions; hence their applications in spasmodic and painful diseases, in hæmorrhagies and increased discharges. In an inflammatory state of the system, the use of some of them is not altogether without danger from their stimulating effects.

CLASS II.—ANTISPASMODICS.

This class might perhaps be considered as a subordinate division of narcotics. They have similar virtues, being used principally to allay pain and inordinate action, and they differ only in not producing that state of general insensibility and diminished action, which arises from the action of narcotics. This might be supposed owing merely to a difference in power; yet there seems also to be something more than this, since they produce no such effect in any dose, and since, although they are so much inferior to narcotics in this respect, they are equally powerful in repressing inordinate and irregular muscular action. This difference may be explained, on the supposition that they are equally powerful stimulants, but are less diffusible, and more durable in their action, or that they are powerful diffusible stimulants, possessing little direct power of diminishing the excitable principle. Considered in this point of view, they will form an intermediate class between narcotics and tonics; and experience shows, that they partake of the properties of both; several narcotics and tonics being frequently used as antispasmodics.

From the name given to this class, their effects may be easily understood. Spasm is an irregular contraction of a muscle; sometimes the contraction is permanent, at other times it alternates with relaxation, but is still irregular. Such medicines as obviate and remove such affections, are termed antispasmodics.

Spasm may arise from various causes. One of the most frequent is a strong irritation continually applied; such as dentition or worms. In these cases, narcotics prove useful, by diminishing irritability and sensibility. Sometimes spasm arises from mere debility; and the obvious means of removing this is by the use of tonics.

Both narcotics and tonics, therefore, are occasionally useful as antispasmodics, such as opium, camphor, and ether, in the one class, and zinc, mercury, and Peruvian bark, in the other. But there are farther, several substances which cannot be with propriety referred to either of these classes, and to these the title of antispasmodics may be more exclusively appropriated.

CLASS III.—TONICS.

By tonics, are understood those substances whose primary operation is to give strength to the system. Their operation is not mechanical, as was once conceived; they act not on the simple solids, increasing their tension or tone, but on the living fibre, and are merely powerful stimulants, permanent in their operation. By producing a gradual excitement, they give vigour to the actions of the system, and as that excitement is gradually produced, it is in like manner gradually diminished, and the habitual stimuli continuing to operate, diminished action does not succeed. Where tonics, however, are given in excess, are used unnecessarily, or for too long a time, they weaken the powers of life.

Tonics act primarily on the stomach, the action they excite in that organ being communicated generally by the medium of the nerves to the rest of the system. Some of them, however, are received into the mass of blood.

The immediate effects of a tonic, given in a full dose, are to increase the force of the circulation, to augment the animal heat, promote the various secretions, or moderate them when morbidly increased, quicken digestion, and render muscular action more easy and vigorous. By some of them, however, these effects are very slowly induced.

The affections of the system in which tonics are employed, must be obviously those of debility; hence their use in the greater part of the diseases to which mankind are subject.

This class may be subdivided into those individuals derived from the mineral, and those from the vegetable kingdoms.

The former division comprehends several of the metals and one or two of the earths. These are in general

more local in their nature than the vegetable tonics, they do not operate so speedily, and seldom occasion considerable excitement.

TONICS FROM THE VEGETABLE KINGDOM.

The tonic power in vegetables is intimately connected with certain sensible qualities, with their bitterness, astringency, and aromatic quality, all of them perhaps possessing these qualities, though, in each, one may be more predominant than the other. The purest bitters, astringents, and aromatics, possess also more or less of a tonic power. Of these divisions, the pure astringents form a distinct class; the remaining tonics may be arranged according as the bitterness or aromatic quality is predominant in them.

The stimulant operation of the purer bitters is little diffusible, and very slow in its operation; their effects are principally on the stomach and digestive organs, to which they communicate vigour, though they also act in some degree on the general system, and obviate debility, as is evident in particular from their efficacy in intermittent fevers, in dropsy, and gout, and from their debilitating effects when used for too long a time.

Aromatics are more rapid and diffusible in their action; they quicken the circulation, and augment the heat of the body. Their action has little permanence; hence, in medicine, they are employed either as mere temporary stimulants, or to promote the action of bitters or astringents.

From these different modes of action of bitters and aromatics, it is evident, that a more powerful tonic will be obtained from the combination of these qualities than where they exist separately. The most powerful tonics are accordingly natural combinations of this kind.

AROMATICS.

The substances belonging to this subdivision of the vegetable tonics, stimulate the stomach and general system, augment the force of the circulation, and increase the heat of the body. They are scarcely sufficiently permanent in their action to be used by themselves as tonics; but they always promote the action of bitters and astrin-

gents, and are used with advantage to obviate symptoms arising from debility of the stomach or intestinal canal. Their aromatic quality in general resides in an essential oil, which in each of them varies in flavour, pungency, and other sensible qualities, but which is nearly alike in its chemical properties. It is soluble entirely in alcohol, is sparingly soluble in water, and is extracted from them by distillation.

CLASS IV.—ASTRINGENTS.

Astringents have been usually considered as substances capable of obviating or removing increased evacuations, by their power of constringing or condensing the simple solids, of which the vessels are formed, and this by an action entirely chemical or mechanical, the same as that which they exert on dead animal matter.

Allowing, however, these substances to posses some power of this kind, their effects as remedies cannot be explained merely from its exertion. Increased evacuations cannot be ascribed to mere mechanical laxity of the solids; and their removal cannot be referred to simple condensation of these solids. Neither can it be admitted that active substances may be applied to the system without occasioning changes in the state of the living powers. Many substances, arranged as astringents, occasion very considerable alterations in several of the functions; they produce effects too which cannot be solely referred to a condensing power, and therefore, in all the changes they produce, part at least of their operation must be referred to their acting on the powers peculiar to life.

For reasons of this kind, some have denied the existence of such remedies, and have considered those which usually receive the appellation of astringents, merely as stimulants, moderate and permanent in their action; in other words, as *tonics* of inferior power. But though there be a great analogy between these two classes in their effects, and probably in their mode of operation, there is also a very obvious difference: the most powerful astringents,—that is, substances which immediately restrain excessive evacuations, being much inferior in real tonic power to other substances having little astringency; while there are powerful tonics, or medicines capable of removing debility, which do not with any uniformity produce the immediate effects of astringents.

Perhaps astringents may be regarded as moderate permanent stimulants, having their stimulant operation modified by their power of condensing the animal fibre by a mechanical, or rather a chemical action. That they exert a stimulant operation, is proved by their power of curing intermittent fever, and other diseases of debility; and that they possess a constringing quality is evident, not only from the sensation they excite on the tongue, but is proved by the change they produce in animal matter. If these combined actions be exerted on the fibres of the stomach, the change produced, it is possible, may be propagated by nervous communication to other parts of the system.

The hypothesis of Dr. Darwin, that astringents produce their effects by powerfully promoting absorption, though it serves to explain part of their operation, seems to be refuted by their power of stopping hæmorrhage.

Some narcotics, as opium, have, in certain cases, effects apparently astringent. These are, where increased discharges arise from irritation, in which, by diminishing irritability, they lessen the discharge; but such an operation is altogether different from that of real astringents.

As remedies against disease, astringents may sometimes, from their moderate stimulant operation, be substituted for tonics. They have thus proved successful in the treatment of intermittent fever; and in all cases of debility, they seem to be serviceable, independent of their power of checking debilitating evacuations.

It is, however, for restraining morbid evacuations that astringents are usually employed. In the various kinds of hæmorrhagy, menorrhagia, hæmoptysis, &c. they are frequently employed with advantage, though their power is also often inadequate to stop the discharge. In diarrhœa they diminish the effusion of fluids, and at the same time give tone to the intestinal canal, and thus remove the disease. In the latter stage of dysentery they prove useful by a similar operation. In profuse sweating, and in diabetes, they are frequently sufficiently powerful to lessen the increased discharge; and in those kinds of inflammation, termed passive, and even in certain cases of active inflammation, they are applied with advantage as topical remedies.

It is an obvious caution, that astringents are not to be used to check critical evacuations, unless these proceed to excess.

Astringents may be subdivided into those belonging to the vegetable, and those belonging to the mineral kingdom, which differ very considerably from each other in their operation.

VEGETABLE ASTRINGENTS.

Astringency in vegetables seems to be connected with a certain chemical principle, or at least with some peculiarity of composition, since vegetable astringents uniformly possess certain chemical properties. The astringency is extracted both by water and alcohol, and these infusions strike a black colour with any of the salts of iron, and are capable of corrugating more or less powerfully dead animal matter.

Chemical investigations have accordingly discovered two distinct principles in the vegetable astringents, one or both of which may probably give rise to the astringent property. One of these, the gallic acid, is distinguished by its property of striking a deep black colour with the salts of iron; the other, the tanning principle, or tannin, is characterized by its strong attraction to animal gelatin, with which it combines, and forms a soft ductile mass, insoluble in water. These may be separated by a solution of animal jelly, which unites with the tannin, and leaves the gallic acid pure.

As both these principles exist in all the stronger vegetable astringents, it is probable that the corrugating property by which the action of these substances as medicines is modified, depends on their combination, especially as, in their action on dead matter, the change produced on the animal fibre by the gallic acid, promotes the combination of that fibre with the tanning principle.

MINERAL ASTRINGENTS.

Of these, the principal are the mineral acids, especially the sulphuric, and the combinations it forms with some of the metals and earths.

LOCAL STIMULANTS.

CLASS V.—EMETICS.

Emetics are substances capable of exciting vomiting, independent of any effect arising from the mere quantity

of matter introduced into the stomach, or of any nauseous taste or flavour.

The effects of an emetic, are an uneasy sensation in the stomach, with nausea and vomiting. While the nausea only is present, the pulse is feeble, quick and irregular, and the countenance pale: during vomiting the face is flushed, the pulse is quicker, and it remains so during the intervals of vomiting. When the operation of vomiting has ceased, the nausea goes off gradually; the patient remains languid, and often inclined to sleep; the pulse is weak, but becomes gradually slow and full, and the skin is commonly moist.

The general nature of vomiting is sufficiently evident. The peristaltic motion of the stomach is inverted, the diaphragm and abdominal muscles are called into action by association, and the pylorus being contracted, the contents of the stomach are forcibly discharged. The peristaltic motion of the upper part of the intestinal canal is likewise frequently inverted.

How this peristaltic motion is thus inverted, it is difficult to explain. The substances which have this effect, no doubt possess a stimulant power, but the effect is by no means produced in proportion to the degree of stimulant operation exerted on the stomach, and it has not been explained how such an operation can invert the usual motion.

Dr. Darwin considers vomiting as the effect, not of increased action from the operation of a stimulus, but of diminished action, arising from the disagreeable sensation of nausea. This being induced, the usual motion is gradually lessened, stopt, and is at length inverted, which gives rise to the phenomena of vomiting.

The susceptibility of vomiting is very different in different individuals, and is often considerably varied by disease.

Though nausea generally accompanies vomiting, this is scarcely a necessary connexion: some emetics acting without occasioning much nausea, while others induce it in a much greater degree than is proportioned to their emetic power.

The feeble and low pulse which accompanies vomiting, has been ascribed to direct association between the motions of the stomach and those of the heart, or it may be owing to the nausea excited, which being a disagreeable sensation, is equivalent to an abstraction of stimulus.

It is supposed also, that a sympathy exists between the stomach and the surface of the body, so that the state of the vessels of the one part is communicated to the vessels of the other. Hence vomiting is frequently followed by diaphoresis.

Emetics powerfully promote absorption.

They often occasion increased evacuation by the intestinal canal, more especially when they have been given in too small a dose to excite vomiting, an effect arising from their stimulating power.

Lastly, several of the effects of vomiting have been ascribed to the agitation of the body, and to the compression of the viscera, by the action of the diaphragm and abdominal muscles.

Emetics are employed in many diseases.

When any morbid affection depends upon, or is connected with over-distention of the stomach, or the presence of acrid indigestible matters, vomiting gives speedy relief. Hence its utility in impaired appetite; acidity in the stomach; in intoxication, and where poisons have been swallowed.

From the pressure of the abdominal viscera in vomiting, emetics have been considered as serviceable in jaundice arising from biliary calculi obstructing the hepatic ducts.

The expectorant power of emetics, and their utility in catarrh and phthisis, have been ascribed to a similar pressure extended to the thoracic viscera.

In the different varieties of febrile affections, much advantage is derived from exciting vomiting, especially in the very commencement of the disease. In high inflammatory fever, it is considered as dangerous; and in the advanced stage of typhus it is prejudicial.

Emetics given in such doses as only to excite nausea, have been found useful in restraining hæmorrhage.

Different species of dropsy have been cured by vomiting, from its having excited absorption. To the same effect, perhaps, is owing the dispersion of swelled testicle, bubo, and other swellings, which has occasionally resulted from this operation.

The operation of vomiting is dangerous or hurtful in the following cases: where there is determination of blood to the head, especially in plethoric habits; in visceral inflammation; in the advanced stage of pregnancy; in

hernia, and prolapsus uteri, and wherever there exists extreme general debility.

The frequent use of emetics weakens the tone of the stomach.

An emetic should always be administered in the fluid form. Its operation may be promoted by drinking any tepid diluent or bitter infusion.

The individual emetics may be arranged under those derived from the vegetable, and those from the mineral kingdom.

CLASS VI.—CATHARTICS.

Cathartics are medicines which quicken or increase the evacuation from the intestines, or which, when given in a sufficient dose, excite purging. They evidently act by augmenting the natural peristaltic motion, from their stimulant operation on the moving fibres of the intestines, whence the contents of the canal are more quickly propelled. The greater number, or perhaps all of them, seem likewise to stimulate the extremities of the exhalant vessels terminating on the internal surface of the intestines, and hence the evacuations they occasion are not only more frequent, but thinner, and more copious.

Besides these immediate actions, the stimulant operation of cathartics appears to be more or less extended to neighbouring organs, and hence they promote the secretion and discharge of the bile, and other fluids usually poured into the intestinal canal. It is also exerted on the stomach, so as to occasion a more quick evacuation of the contents of that organ by the pylorus.

Besides the differences between individual cathartics in quickness, slowness, or other circumstances attending their operation, there is a general difference in the mode in which they act, from which they may be, and usually have been ranked under two divisions. Some operate mildly, without exciting any general affection of the system, without even perceptibly stimulating the vessels of the intestines, and hence they merely evacuate the contents of the canal. Others are much more powerful stimulants: they always occasion an influx of fluids from the exhalant vessels, and neighbouring secreting organs: they extend their stimulus to the system in general, and if taken in too large a dose, excite inflammation on the

surface of the intestines. The former are distinguished by the title of laxatives; the latter are termed purgatives, and the stronger of them drastic purgatives.

Cathartics, as medicines, are capable of fulfilling various indications.

Where there exists a morbid retention of the contents of the stomach, where these contents are acrid, or where extraneous bodies are present, they are calculated by their evacuating power to relieve the symptoms arising from these affections, and hence their utility in constipation, colic, dysentery, and a variety of febrile affections. Partly by exciting the intestines to action, and partly by extending their stimulus to the other abdominal viscera, cathartics are of service in dyspepsia, hypochondriasis, amenorrhœa, jaundice, and visceral obstructions.

By their power of stimulating the exhalant vessels, on the internal surface of the intestinal canal, and causing a larger portion of fluid to be poured out, cathartics are capable of producing a diminution of the fluids with respect to the general system, and of course cause an abstraction of stimulus. Hence purging is a principal part of what is termed the antiphlogistic regimen, and is employed as a remedy of much power in highly inflammatory diseases.

From the same power of causing effusion of fluid, is to be explained the utility of cathartics in the various species of dropsy. A balance is preserved in the system between exhalation and absorption, so that when one is increased, the other is so also. The increased secretion and discharge of serous fluid, which cathartics occasion, causes an increased absorption; whence the effused fluid in dropsy is frequently taken up and removed.

Partly by the serous evacuation which cathartics occasion, and partly by the derivation of blood they make from the head, they are highly useful in the prevention and cure of apoplexy, all comatose affections, mania, phrenitis, and headach.

By a change in the distribution of the blood, it has been supposed that purging determines from the surface of the body; and hence in a great measure has been explained its utility in small-pox and some other eruptive diseases.

The administration of cathartics is rendered improper by inflammation of the stomach or intestines, or tendency to it, and by much debility. Several cautions are likewise requisite in their exhibition. The nausea or griping

they frequently produce, may be obviated by the addition of an aromatic, or by giving them in divided doses. The more powerful cathartics should always be given in the latter mode; and in general they irritate less when given diffused in a fluid than when given in a solid form.

The different cathartics may be considered under the two divisions of laxatives and purgatives: the former being mild in their operation, and merely evacuating the contents of the intestines; the latter being more powerful, and even extending their stimulant operation to the neighbouring parts.

A division of cathartics remains, intermediate in their operation between the laxatives and purgatives, more powerful than the one, less violent and stimulating than the other. These are the neutral salts. They seem to act principally by stimulating the exhalant vessels on the inner surface of the intestines; and by the watery evacuation they occasion, they are particularly adapted to those cases where inflammatory action or tendency to it exists.

The valuable observations of Dr. Hamilton have established still more clearly the importance of this class of remedies, have shewn that they admit of more extensive application, and have pointed out with more precision than has hitherto been done, the principles which regulate their administration.

In many diseases, there exists a state of the intestinal canal giving rise to retention of its contents, which is not to be obviated by the occasional administration of a cathartic, but which requires a continuation of the operation short of that of purging, until the healthy state of the bowels be restored. By this practice the cure of diseases has been accomplished, which, previously to Dr. Hamilton's publication, were treated by very different methods, and were not supposed to be so peculiarly connected with any state of the alvine evacuation. Thus in fever, the peristaltic motion of the intestines is diminished, the feculent matter is retained, and becomes a source of irritation; its evacuation, therefore, by the exhibition of purgatives is clearly indicated, nor has this been altogether neglected.

Physicians, however, were scarcely aware of the necessity of producing it to a sufficient extent; and in fevers of the typhoid type in particular, were frequently deterred from doing so by the fear of reducing the strength of the system by an evacuation considered as debilitating.

Dr. Hamilton's observations establish the propriety of the freer use of purgatives in fever, so as to produce complete and regular evacuation of the bowels, through the whole progress of the disease; and the cases he has published afford striking proofs of the advantages derived from the practice. It is attended with equal advantage in scarlatina. Several of the diseases comprehended under the class neurosis appear to depend on, or to be very intimately connected with a torpid state of the intestines, from which an accumulation of their contents takes place, proving a source of irritation that often affects the general system. Chorea is proved by Dr. Hamilton's observations to arise from this cause, and he has introduced with great success the mode of treatment, by the free use of purgatives, continued until the healthy state of the alvine evacuation has been established. The same practice, and with similar success, applies to hysteria, and, in Dr. Hamilton's opinion, to that species of tetanus, which, prevailing in warm climates, and in warm seasons, appears to have its origin in disorder of the stomach and bowels. And ample evidence has established the success of the same treatment in the marasmus which attacks the young of both sexes, which is marked by loss of appetite, weakness, wasting of the body, and at length total prostration of strength; likewise in chlorosis, and in that hæmatemesis to which females are liable between eighteen and thirty years of age. In some of these diseases, the quantity of matter accumulated in the intestines is extremely great; the extent to which the exhibition of purgatives must be carried, and the length of time during which they must be continued, much exceed what would be calculated on from the usual administration of remedies of this class. The whole practice requires therefore both decision and perseverance. Analogies from some of these diseases lead to a similar exhibition of cathartics in other fevers, particularly in the bilious remitting fever of warm climates, in measles, erysipelas, and small pox; likewise in scrofula, in dyspepsia, whether simple, or complicated with hysterical or hypochondriacal mania; in cramp of the stomach, or of the extremities; in palpitation of the heart, and in those cases of hydrophobia which are not the effect of specific contagion.

Cathartics, especially the more powerful ones, require to be administered with caution even in diseases where they are indicated, by peculiar circumstances, particularly

any tendency to inflammation or to extreme debility; also during pregnancy, immediately after delivery, during the flow of the menses, and in those liable to hæmorrhoidal affections. The too frequent use of them induces wasting of the body, and sometimes renders the intestines morbidly irritable, so that purging is easily excited, while in other habits it renders them more torpid, and induces costiveness.

Dr. Hamilton has pointed out the common error in the exhibition of cathartics, that of their not being given to the requisite extent; and given the general rule in all morbid affections, of repeating, and, if necessary, enlarging the dose while the evacuations remain offensive, or of an unnatural appearance, without however carrying their administration so far as to produce purging, unless this be the indication which is designed to be fulfilled. To this class of remedies may be added those substances which act as cathartics under the form of enema.

CLASS VII.—EMMENAGOGUES.

The medicines arranged under this class are those capable of promoting the menstrual discharge.

As the suppression of this discharge is usually owing to debility of the uterine vessels, or want of action in them, the medicines capable of exciting it must be those which can stimulate these vessels.

General stimulants or tonics must have this effect to a certain extent, and there are several stimulants both diffusible and permanent, employed as Emmenagogues.

It is doubtful, whether there are further any medicines, which have their stimulant operation particularly determined to the uterine vessels. There are several, however, which, acting on neighbouring parts, have their action extended to the uterus, and hence exert an emmenagogue power greater than can be ascribed to any general stimulant operation they exert on the system. Several cathartics act in this manner.

Under one or other of these divisions, may be arranged the principal medicines employed as emmenagogues.

CLASS VIII.—DIURETICS.

Diuretics are those medicines which increase the urinary discharge.

It is obvious that such an effect will be produced by any substance capable of stimulating the secreting vessels of the kidneys. All the saline diuretics seem to act in this manner. They are received into the circulation, and, passing off with the urine, stimulate the vessels, and increase the quantity secreted.

There are other diuretics, the effect of which appears not to arise from direct application, but from an action excited in the stomach, and propagated by nervous communications to the secreting urinary vessels. The diuretic operation of squill, and of several other vegetables, appears to be of this kind.

There is still, perhaps, another mode in which certain substances produce a diuretic effect, that is, by promoting absorption. When a large quantity of watery fluid is introduced into the circulating mass, it stimulates the secreting vessels of the kidneys, and is carried off by the urine. If, therefore, absorption be promoted, and if a portion of serous fluid, perhaps previously effused, be taken up, the quantity of fluid secreted by the kidneys will be increased. In this way digitalis seems to act: its diuretic effect, it has been said, is greater when exhibited in dropsy than it is in health.

On the same principle, (the effect arising from stimulating the absorbent system,) may probably be explained the utility of mercury in promoting the action of several diuretics.

The action of these remedies is promoted by drinking freely of mild diluents. It is also influenced by the state of the surface of the body. If external heat be applied, diuresis is frequently prevented, and diaphoresis produced. Hence the doses of them should be given in the course of the day, and the patient if possible be kept out of bed.

The direct effects of diuretics are sufficiently evident. They discharge the watery part of the blood; and by that discharge they indirectly promote absorption over the whole system.

Dropsy is the disease in which they are principally employed, and when they can be brought to act, the dis-

case is removed, with less injury to the patient than it can be by exciting any other evacuation. Their success is very precarious, the most powerful often failing; and as the disease is so frequently connected with organic affection, even the removal of the effused fluid, when it takes place, only palliates without effecting a cure.

Diuretics have been likewise occasionally used in calculous affections, in gonorrhœa, and with the view of diminishing plethora, or checking profuse perspiration.

CLASS IX.—DIAPHORETICS.

Diaphoretics are those medicines which increase the natural exhalation by the skin. When this is carried so far as to be condensed on the surface, it forms sweat; and the medicines producing it are named sudorifics. Between diaphoretics and sudorifics, there is no distinction; the operation is in both cases the same, and differs only in degree, from augmentation of dose, or employment of assistant means.

Since diaphoresis or sweat is merely the increase of the natural exhalation, it must arise from increased action of the cutaneous exhalant vessels, and the medicines belonging to this class must be those which are capable of exciting that action.

Of stimulants capable of producing this effect, the application of heat to the surface affords an example. It is one of the most effectual, and is always employed to promote the action of sudorifics.

The same effect may be produced indirectly, by increasing the general force of the circulation, which acts as a stimulus on the exhalant vessels, and increases their discharge.

By one or other of these modes of operation, the medicines classed as diaphoretics seem to act.

The saline diaphoretics, as they do not sensibly augment the force of the circulation, probably act in the former manner, exerting a particular action on the stomach, which is communicated to the vessels of the skin, or perhaps being received into the blood, and directly applied to these vessels.

Those diaphoretics, on the contrary, which are termed heating, as the aromatic oils and resins, act by directly

stimulating the heart and arteries, and increasing the force of the circulation.

Diaphoresis is not, however, the necessary consequence of the circulation being increased; for the surface often remains dry, where the pulse is frequent and strong. In this case, a morbid constriction of the cutaneous vessels exists, which opposes a resistance to the impetus of the blood. Whatever, therefore, relaxes these vessels, will favour the production of sweating; and to this mode of operation probably is to be ascribed the diaphoresis produced by antimonial preparations, or by ipecacuan, and in part the advantage derived from the use of warm diluents in promoting sweat. When these circumstances, the increase of the force of the circulation, and the relaxation of the cutaneous vessels, are conjoined, the sweating will be still more copious; and from this probably arises the superiority of the combination of opium with antimony or ipecacuan, to any other sudorific.

The primary effects of diaphoretics, are to evacuate the watery part of the blood, and thus lessen the quantity of the fluid in the circulating system; to determine the blood to the surface; to increase the action of the absorbents, and to remove spasmodic constriction of the cutaneous vessels, and render the skin moist.

The first of these effects probably takes place to no great degree, as the free use of diluents makes part of the sweating regimen.

The last effect, the changing the state of the vessels on the skin, is the most important, considered in a practical point of view, that diaphoretics produce, as on this their efficacy in fever, in which principally they are employed, depends.

The limits to the practice of sweating in affections of a febrile kind, are now sufficiently established. It is attended with advantage in synocha, and the various phlegmasiæ; but in fevers of the typhoid kind it is useless, and, unless in the very commencement of the disease, is uniformly hurtful.

As evacuating the serous part of the blood, and as promoting absorption, sudorifics have been used with advantage in the different species of dropsy, especially in anasarca.

By determining to the surface, and preserving a gentle diaphoresis, they are found serviceable in asthma, dyspepsia, habitual diarrhœa, chronic dysentery, and chronic

rheumatism, and likewise in a number of cutaneous diseases, probably by altering the state of the extreme vessels of the skin.

A few circumstances are to be attended to in the administration of sudorifics. In inflammatory affections, if the action of the vascular system is strong, bleeding should be previously used: during the sweating, the free use of warm diluents is necessary; and external cold ought to be guarded against.

The particular diaphoretics may be arranged from the affinity in their operation, as they act by increasing the force of the circulation, or as they operate without producing any general stimulant effect.

CLASS X.—EXPECTORANTS.

Expectorants have been defined, those medicines which facilitate or promote the rejection of mucus or other fluids from the lungs and trachea. The theory of their operation is very imperfectly understood. It has been supposed that where a greater quantity of fluid is thrown out into the lungs than the exhalants can take up, there are remedies which may facilitate its rejection. But as expectoration is an operation partly voluntary, and dependent on the action of a number of muscles, it is difficult to discover how such an effect can be produced. If by expectorants be meant substances capable of producing it by some specific action on the parts concerned, there seems no reason to believe in the existence of such remedies.

Dr. Cullen supposed that expectorants might act by promoting the exhalations of a thin fluid, which diluting the viscid mucus present in the mucous follicles in the lungs and trachea, might facilitate its rejection. But the action of the different individuals belonging to the class, and especially their effects in various diseases, cannot be explained on this principle.

There are probably various modes of operation by which certain remedies will appear to promote expectoration, and which will give them a claim to the title of expectorants.

Thus, in certain diseases the exhalant vessels in the lungs, seem to be in that state, by which the exhalation of fluid is lessened, or nearly stopped, and in such cases

expectoration must be diminished. Any medicine capable of removing that constricted state, will appear to promote expectoration, and will at least relieve some of the symptoms of the disease. It is apparently by such a mode of operation, that antimony, ipecacuan, squill, and some others, promote expectoration in pneumonia, catarrh, and asthma, the principal diseases in which expectorants are employed.

There is a case of an opposite kind, that in which there is a redundance of mucus in the lungs, as occurs in humoral asthma, and *catarrhus senilis*. In these affections, certain expectorants are supposed to prove useful. If they do so, it is probably by being determined more particularly in their action to the pulmonary vessels, and by their moderate stimulus diminishing the secretion, or increasing the absorption, thus lessening the quantity of fluid, and thereby rendering the expectoration of the remainder more easy. The determination of these substances to the lungs is often perceptible by their odour in the air expired. A similar diminution of fluid in the lungs may be effected by determining to the surface of the body; and those expectorants which belong to the class of diaphoretics probably act in this manner.

Expectorants, then, are to be regarded, not as medicines which directly assist the rejection of a fluid already secreted, but rather as either increasing the natural exhalation where it is deficient, or diminishing the quantity of fluid where it is too copious, either by stimulating the pulmonary vessels, or by determining to the surface. In both cases expectoration will appear to be promoted or facilitated.

Pneumonia, catarrh and asthma, are the principal diseases in which expectorants are employed; and the mode in which they prove useful will be apparent from what has been said of their operation.

CLASS XI.—SIALAGOGUES.

Sialagogues are substances which increase the quantity of the salivary discharge. This may be effected by the mastication of certain acrid substances, or by the internal exhibition of certain medicines.

Of those which act in the latter mode, *Mercury* is the only one that uniformly produces this effect. No satis-

factory explanation has been given of this peculiar power which it exerts; and the inquiry why it should be particularly directed to the salivary glands, appears as fruitless as that into the specific virtue of any medicine. It does not from its sialagogue power appear to be of advantage in the treatment of any disease; salivation being only a test of its action on the system, but not in itself of any utility.

The remaining sialagogues are those which act merely by topical application by mastication, and from their acrid stimulating quality. By increasing the salivary discharge, they have been found of service in toothach, and, as has been supposed, in some kinds of headach.

CLASS XII.—ERRHINES.

Errhines are medicines which occasion a discharge from the nostrils, either of a mucous or serous fluid. They all operate by direct application, and generally in consequence of a greater or less degree of acrimony which they possess. Their practical uses, it is evident, must be very limited. By the evacuation they occasion, it is supposed that they may diminish the quantity of fluid in the neighbouring vessels; and that they hence may prove useful in rheumatic affections of these parts, in headach, pain of the ear, and ophthalmia. They are sometimes used with advantage in some of these affections. It has likewise been imagined that they may be of use in preventing apoplexy.

CLASS XIII.—

EPISPASTICS AND RUBEFACIENTS.

These, as they operate on the same principles, and produce the same effects only in different degrees, may be considered merely as subdivisions of one class.

EPISPASTICS.

Epispastics are those substances which are capable, when applied to the surface of the body, of producing a serous or puriform discharge, by exciting a previous state of inflammation. The term, though comprehending

likewise issues and setons, is more commonly restricted to blisters,—those applications which, exciting inflammation on the skin, occasion a thin serous fluid to be poured from the exhalants, raise the cuticle, and form the appearance of a vesicle. This effect arises from their strong stimulating power, and to this stimulant operation, and the pain they excite, are to be ascribed the advantages derived from them in the treatment of disease. The evacuation they occasion is too inconsiderable to have any effect.

It is a principle sufficiently established with regard to the living system, that where a morbid action exists, it may often be removed by inducing an action of a different kind in the same or in a neighbouring part. On this principle is explained the utility of blisters in local inflammation and spasmodic action, and it regulates their application in pneumonia, gastritis, hepatitis, phrenitis, angina, rheumatism, colic, and spasmodic affections of the stomach; diseases in which they are employed with the most marked advantage.

A similar principle exists with respect to pain; exciting one pain often relieves another. Hence blisters often give relief in toothach, and some other painful affections.

Lastly, blisters, by their operation, communicate a stimulus to the whole system, and raise the vigour of the circulation. Hence, in part, their utility in fevers of the typhoid kind, though in such cases they are used with still more advantage to obviate or remove local inflammation.

RUBEFACIENTS.

Rubefacients excite pain and inflammation, but in a less degree than blisters, so that no fluid is discharged. They stimulate the system in general, and obviate local inflammation, and are used for nearly the same purposes as blisters.

Any stimulating application may be used for this purpose.

Cantharides added in a small proportion to a plaster, or the tincture of cantharides applied by friction to a part, is often employed as a rubefacient.

Ammonia mixed with one, two, or three parts of expressed oil, forms a liniment frequently used for this purpose in rheumatism, angina, and other cases of local inflammation.

REMEDIES ACTING CHEMICALLY.

CLASS XIV.—REFRIGERANTS.

The remedies comprised under this class have been usually defined, substances which directly diminish the force of the circulation, and reduce the heat of the body, without occasioning any diminution of sensibility or nervous energy. The theories, that have been delivered respecting their mode of operation, are obscure or unintelligible; and even the facts, which are adduced to establish the existence of such remedies, are far from being conclusive.

Keeping in view the very inconsiderable action of these remedies, it may perhaps be possible, from the consideration of the mode in which animal temperature is generated, to point out how their trivial refrigerant effects may be produced.

It has been sufficiently established, that the consumption of oxygen in the lungs is materially influenced by the nature of the ingesta received into the stomach; that it is increased by animal food and spirituous liquors, and, in general, by whatever substances contain a comparatively small quantity of oxygen in their composition. But the superior temperature of animals is derived from the consumption of oxygen gas by respiration. An increase of that consumption must necessarily, therefore, occasion a greater evolution of caloric in the system, and of course an increase of temperature, while a diminution in the consumption of oxygen must have an opposite effect. If, therefore, when the temperature of the body is morbidly increased, substances be introduced into the stomach, containing a large proportion of oxygen, especially in a state of loose combination, and capable of being assimilated by the digestive powers, the nutritious matter received into the blood, must contain a larger proportion of oxygen than usual; less of that principle will be consumed in the lungs, by which means less caloric being evolved, the temperature of the body must be reduced: and this operating as a reduction of stimulus, will diminish the number and force of the contractions of the heart.

It might be supposed that any effect of this kind must be trivial, and it actually is so. It is, as Cullen has remarked, not very evident to our senses, nor easily subjected

to experiment, and is found only in consequence of frequent repetitions.

The principal refrigerants are the acids, especially those belonging to the vegetable kingdom. As these contain a large proportion of concrete oxygen in a state of loose combination, their refrigerant power may be explained on the above principle. The neutral salts form the remaining division of refrigerants; they are much inferior in power; and what refrigerant quality they do exert, probably arises from the same cause. In some of them, it may be increased by the sensation of cold they excite in the stomach, which is equivalent to an abstraction of stimulus.

It is obvious, that the indication to be fulfilled by the use of refrigerants, is the reduction of the morbidly increased temperature. Hence they are administered in synocha and other inflammatory affections, and likewise in fevers of the typhoid kind.

ACIDS.

All acids are supposed to be refrigerants; but the vegetable acids are allowed to possess this power in a more eminent degree.

The native vegetable acids are found chiefly in the fruits of vegetables. The sour juice of these fruits consists either of the citric or malic acids, or more frequently of a mixture of both. The citric acid is that which is most largely employed, as it forms chiefly the acid juice of the orange and lemon, the two acid fruits in common medicinal use.

CLASS XV.—ANTACIDS.

Antacids are remedies which obviate acidity in the stomach. Their action is purely chemical, as they merely combine with the acid present, and neutralize it. They are only palliatives, the generation of acidity being to be prevented by restoring the tone of the stomach, and its vessels. Dyspepsia and diarrhœa are the diseases in which they are employed.

CLASS XVI.—LITHONTRIPTICS.

Lithontriptics are medicines supposed to be capable of dissolving urinary calculi. Their operation is entirely chemical.

The researches of modern chemists have proved, that these calculi, in general, consist principally of a peculiar animal acid, named the lithic or uric acid. With this substance the alkalies are capable of uniting, and of forming a soluble compound; and these are accordingly the sole lithontripties.

From the exhibition of alkaline remedies, the symptoms arising from a stone in the bladder are very generally alleviated; and they can be given to such an extent, that the urine becomes sensibly alkaline, and is even capable of exerting a solvent power on these concretions. Their administration cannot, however, be continued to this extent for any considerable length of time, from the strong irritation they produce on the stomach and urinary organs. The use, therefore, of the alkalies as solvents, or lithontripties, is now scarcely ever attempted; they are employed merely to prevent the increase of the concretion, and to palliate the painful symptoms, which they do, apparently by preventing the generation of lithic acid, or the separation of it by the kidneys; the urine is thus rendered less irritating, and the surface of the calculus is allowed to become smooth.

When the alkalies are employed with this view, they are generally given saturated, or even super-saturated, with carbonic acid. This renders them much less irritating. It at the same time diminishes, indeed, their solvent power; for the alkaline carbonats exert no action on the urinary calculi: But they are still equally capable of correcting that acidity in the *primæ viæ*, which is the cause of the deposition of the lithic acid from the urine, and therefore serve equally to palliate the disease. And when their acrimony is thus lessened, their use can be continued for any length of time.

CLASS XVII.—ESCHAROTICS.

Escharotics are substances capable of dissolving animal matter; applied to the skin, they erode it, and to

an ulcer, they remove its surface. They are employed to consume excrescences, to open an ulcer, and to change the diseased surface of a sore already existing. Their action is entirely chemical.

REMEDIES ACTING MECHANICALLY.

CLASS XVIII.—ANTHELMINTICS.

Anthelmintics are those medicines used to expel worms from the intestinal canal. The greater number of them act mechanically, dislodging the worms, by the sharpness or roughness of their particles, or by their cathartic operation. Some seem to have no other qualities than those of powerful bitters, by which they either prove noxious to these animals, or remove that debility of the digestive organs, by which the food is not properly assimilated, or the secreted fluids poured into the intestines are not properly prepared; circumstances from which it has been supposed the generation of worms may arise.

CLASS XIX.—DEMULCENTS.

Demulcents are defined, "Medicines suited to obviate and prevent the action of acrid and stimulant matters, and that, not by correcting or changing their acrimony, but by involving it in a mild and viscid matter, which prevents it from acting upon the sensible parts of our bodies," or by covering the surface exposed to their action.

Where these substances are directly applied to the parts affected, it is easy to perceive how benefit may be derived from their application. But where they are received by the medium of the stomach into the circulating system, it has been supposed that they can be of no utility, as they must lose that viscidity on which their lubricating quality depends. Hence it has been concluded, that they can be of no service in gonorrhœa, and some similar affections. It is certain, however, that many substances which undergo the process of digestion are afterwards separated in their entire state from the blood, by particular secreting organs, especially by the kidneys; and it is

possible that mucilaginous substances, which are the principal demulcents, may be separated in this manner. There can be no doubt, however, but that a great share of the relief demulcents afford in irritation or inflammation of the urinary passages, is owing to the large quantity of water in which they are diffused, by which the urine is rendered less stimulating from dilution. In general, demulcents may be considered merely as substances less stimulating than the fluids usually applied.

Catarrh, diarrhœa, dysentery, calculus, and gonorrhœa, are the diseases in which demulcents are employed. As they are medicines of no great power, they may be taken in as large quantities as the stomach can bear.

The particular demulcents may be reduced to the two subdivisions of mucilages and expressed oils.

CLASS XX.—DILUENTS.

Diluents are defined, those substances which increase the proportion of fluid in the blood. It is evident that this must be done by watery liquors. Water is indeed, properly speaking, the only diluent. Various additions are made to it, to render it pleasant, and frequently to give it a slightly demulcent quality. But these are not sufficiently important to require to be noticed, or to be classed as medicines.

Diluents are merely secondary remedies. They are given in acute inflammatory diseases, to lessen the stimulant quality of the blood. They are used to promote the action of diuretics in dropsy, and to favour the operation of sweating.

CLASS XXI.—EMOLLIENTS.

Emollients are those medicines, according to the definition of Dr. Cullen, which diminish the force of cohesion in the particles of the solid matter of the human body, and thereby render them more lax and flexible. Their operation is mechanical; they are insinuated into the matter of the solid fibre, and lessen the friction between its particles. They are useful when the fibres are rigid, or when they are much extended, and therefore afford relief when topically applied to inflamed parts, to

tumours distending the skin, or where the skin is dry and rigid.

Heat conjoined with moisture is the principal emollient; and water applied warm by the medium of some vegetable substances, constituting the various fomentations and cataplasms, is the form under which it is applied, the vegetable matter serving to retain the heat, and to allow the proper application of the moisture.

Oils and unctuous substances are the only other emollients; they are merely introduced by friction. Any of the expressed oils already noticed, or lard, (axungia porcina) may be used for this purpose.

The preceding observations are inserted, not with the view of adopting Murray's classification of remedies, but to give a general idea of the virtues of such medicinal substances as are possessed of the qualities which make the objects of the respective articles. I shall therefore proceed to an account of each of the remedies separately, and in alphabetical order.

Acidum Acetosum. *Acetous acid. Vinegar.*

Vinegar was known many ages before the discovery of any other acid, those only excepted which exist ready formed in vegetables. It is mentioned by Moses, and indeed seems to have been in common use among the Israelites and other eastern nations at a very early period. This agreeable pungent acid is the product of the fermentation of solutions of saccharine matter or sweet vegetable juices. It is obtained from wine, cider, beer, or other fermented liquors, which are the products of the first stage of the fermentative process. The acetous fermentation is nothing more than the acidification or oxygenation of wine, produced in the open air by means of the absorption of oxygen. Vinegar is composed of hydrogen and carbon united together in proportions not yet ascertained, and changed into the acid state by oxygen. That prepared from white wine is most free from impurities. Beside the pure acetous acid diluted with much water, vinegar contains tartarous acid, tartrite of potass, mucilaginous matter, and sometimes phosphoric acid. From the mucilaginous impurities which all vinegars contain, they are apt, on exposure to the air, to become turbid and ropy, and at length vapid. This inconvenience may

be obviated by the following method. Boil vinegar in a well tinned kettle for a quarter of an hour, and bottle it, or fill the bottles with vinegar and put them into a kettle full of water upon the fire. After the water has boiled for an hour, they are to be taken out and corked. Vinegar thus boiled, will keep for several years, without growing turbid or mouldy. The acetous acid may be concentrated by suffering vinegar to freeze; after which separate the fluid from the ice, and secure it in a bottle. By the process of distillation vinegar is rectified, and the acetous acid concentrated and rendered more suitable for pharmaceutical preparations.

Vinegar possesses strong antiseptic powers, and its action on the living body is gently stimulant and astringent. It is employed as a useful addition to the patient's drink in putrid and inflammatory fevers. In ardent, bilious fevers, pestilential and other malignant distempers, it is recommended by Boarhaave as one of the most certain sudorifics. In the form of clyster it is used in the same diseases, and in obstinate constipation. Faintings, vomiting, hysterical and hypocondriacal complaints, have been frequently relieved by vinegar applied to the mouth and nose, or received into the stomach. It is highly serviceable in obviating the effects of poisonous substances of the vegetable kind, when taken into the stomach, as well as in promoting their discharge by the different emunctories, when received into the blood. When fully saturated with muriate of soda (common salt) it has been resorted to as a valuable remedy in dysentery, and angina maligna; one table-spoonful of this mixture, with two of hot water, gradually swallowed and frequently repeated, will seldom fail to induce a diaphoresis, and procure essential relief from the most distressing symptoms attending these dangerous diseases.

The same saturated mixture may also be applied to local inflammations with the happiest effects. Vinegar is applied externally in fomentations and baths, as a stimulant and discutient; and its vapour is inhaled in putrid sore throat; and diffused through the chambers of the sick to correct the putrescency of the atmosphere.

Vinegar is an article of very considerable use in surgery. Mixed with farinaceous substances it is frequently applied to sprained joints, and in conjunction with alcohol and water it makes an eligible lotion for inflammation of the surface of the body. Vinegar has acquired

reputation at the Gloucester infirmary, for quickening the exfoliation of dead bone, which may be owing to its property of dissolving the phosphat of lime. The excellent effects of vinegar, when immediately applied to burns and scalds, have been taken particular notice of by Mr. Cleghorn, a brewer in Edinburgh, who communicated his sentiments to Mr. Hunter. He recommends the immediate application of vinegar, which is to be continued, for some hours, by any the most convenient means until the pain abates. Should it return, the vinegar is to be repeated. In cold weather, Mr. Cleghorn directs the vinegar to be made a little warm, with the view of preventing the occurrence of tremblings, and chillness, which are sometimes induced when applied quite cold.

ACIDUM SULPHURICUM. *Sulphuric Acid. Oil of Vitriol.*

Sulphur combines with oxygen in different proportions; when united with the largest proportion, it forms an acid extremely powerful from its state of concentration, the sulphuric acid. This acid used to be obtained from the decomposition of sulphate of iron, the green vitriol of commerce, by heat; and hence the name of vitriolic acid which was given to it. It is now formed by the combustion of sulphur. The sulphur reduced to powder is mixed with from one-eighth to one-tenth of its weight of nitrate of potass, by which its combustion when begun can be continued without the free access of atmospheric air, the nitric acid of the nitrate affording the requisite quantity of oxygen. It is thus burnt in a large leaden chamber; the sulphuric acid, which is slowly formed, is absorbed by water placed in the bottom of the chamber; the acid liquor is concentrated by exposing it to heat in glass retorts, and the pure sulphuric acid is obtained. It is of a thick consistence, and has an apparent unctuosity; its specific gravity is 1850; when pure, it is colourless and transparent. It strongly attracts water, which it imbibes from the atmosphere very rapidly, and in large quantities, if suffered to remain in an open vessel. If it be mixed with water, it produces an instantaneous heat, nearly equal to that of ebullition. Its action is very strong upon all the earths, except the siliceous; upon the alkaline salts; upon many metals; and almost every other combustible substance. It is highly corrosive; and in fine, possesses all the general acid properties in an

eminent degree. When sufficiently diluted, this acid is an excellent tonic, and its astringency is considered as superior to that of any other acid. It is therefore used in hæmoptysis, menorrhagia, diabetes, hectic, and dyspepsia. From its refrigerant and antiseptic properties, it is a valuable medicine in many febrile diseases, especially those called putrid. Checking fermentation, exciting appetite, promoting digestion, and quenching thirst, it is exhibited with success in acidity, weakness, and relaxation of the stomach. If taken in a considerable quantity, or for any length of time, it seems to pass off undecomposed by the kidneys or skin; and it is perhaps by its stimulant action on the latter, that it is advantageously employed in psora and other cutaneous affections. In its concentrated state, its dose cannot be measured. In the pharmacopœias therefore, it is ordered to be kept diluted. The best mode of prescribing it, is to mix the quantity of acid to be used, with as much water as will render it palatable, to which some syrup or mucilage may be added. To prevent it from attacking the teeth, it may be conveniently sucked through a quill, and the mouth should be carefully washed after each dose. From its astringent powers, this article is generally added to gargles, which are employed to check salivation, or relieve inflammatory affections of the uvula, and apthous mouths. According to Dr. Sims, and others, experience has demonstrated the superior efficacy of sulphuric acid when freely administered, as a remedy in *Scarlatina Anginosa*.

Mixed with lard, in the proportion of half a drachm to an ounce, it has been used externally with advantage in cutaneous affections and ill conditioned ulcers. The different combinations of this acid, and the processes in which it is employed, will be found under the head of preparations.

Acipenser Sturio. *Ichthyocolla. Isinglass.*

This substance is obtained from the skin and other parts of the Sturgeon, as well as several other kinds of fish caught in the northern seas.

The internal skin is boiled in water; the strained decoction is inspissated; and the solid mass formed into convoluted pieces is the isinglass of the shops. The sounds or air-bladders of fresh water fish, in general, are

the most transparent, flexible, and delicate substances, and consequently furnish the finest isinglass. The preparation of isinglass is almost peculiar to Russia. It is made in all places where the large species of acipenser or sturgeon are caught; that prepared from the sturgeon is reckoned the best. It varies in quality according to the mode of preparation. The best is usually rolled into the form of a snake or heart; the second folded in leaves like a book; and the worst is dried without any care.

Good isinglass is white, in some degree transparent, dry, composed of membranes, not too thick, and without smell. The properties of isinglass depend entirely on the gelatin of which it principally consists. One hundred grains of good isinglass were found by Mr. Hatchett to contain rather more than ninety-eight of matter soluble in water.

A watery solution of it is used as a test of the presence of tannin, and for the clarification of spirituous liquors. Mr. Davy's solution for the former purpose consists of one hundred and twenty grains of isinglass dissolved in twenty ounces of water; and if properly made, it has a tendency to gelatinate, at temperatures below 50° F.

In a medical view, isinglass is but seldom employed. When boiled in fresh milk to the consistence of a strong jelly, it affords a very nourishing food to invalids; though it should be eaten with precaution by those who possess a weak stomach, or digest slowly; as it has a great tendency to turn rancid and putrid. It is said to be employed for the preparation of English court plaster, a solution of it being spread on black silk.

As the sturgeon abounds in the rivers of the United States, and the demand for isinglass is extensive and yearly increasing, it is highly important that the attention of our citizens should be turned to the preparation of it. And it fortunately appears that a new domestic source for this article has lately been discovered. Mr. Daniel Waldron of Westchester county, N. Y. has discovered that the *vesicula natatoria* of a certain fish, frequent on the coast of New-York and of the United States, affords a true isinglass which is capable of being employed for all the common purposes of Russian isinglass. Mr. Waldron is about obtaining a patent for his valuable discovery.

ACONITUM NAPELLUS. *Large blue Wolfsbane. Monkshood. Aconite.* The herb and root.

This is an exotic perennial, growing wild in the mountainous parts of Switzerland and France. It is frequently cultivated in gardens in this country. The characters which distinguish the several species of aconite are so obscure as to occasion considerable confusion. The species used in medicine called monkshood has long spikes of large blue flowers, and three capsules to a flower. The leaves are many, cleft with linear divisions, broadest at top, and marked with a line running along them. The juice of this plant possesses a disagreeable smell and an acrid taste: of the latter, however, it is in a great measure divested by inspissation. The fresh leaves have very little smell, but when chewed have an acrid taste, and excite lancinating pains, and swelling of the tongue. By drying, their acrimony is almost entirely destroyed. For medical use the root must be gathered before the stem shoots. Being one of the most violent vegetable poisons, when taken in large doses, it excites sickness, vomiting, diarrhœa, giddiness, delirium, fainting, cold sweats, convulsions and death. Yet on many occasions it has been found a very effectual remedy in glandular swellings, venereal nodes, anchylosis, spina ventosa, itch, amaurosis, gouty and rheumatic pains, intermittent fevers, and convulsive disorders. When properly administered, it acts as a penetrating stimulus, and generally excites sweat, and sometimes an increased discharge of urine. It is commonly used in the form of an inspissated juice. As soon as the plant is gathered, the juice is expressed, and evaporated without any previous clarification, to the consistence of an extract. It is an unfortunate circumstance, that the powers of this medicine vary very much, according to its age; and the heat employed in its preparation. When recently prepared, its action is often too violent, and when kept more than a year, it becomes totally inert. It may therefore be laid down as a general rule, in the employment of this and many other similar active medicines, to begin with very small doses, and to increase them gradually to the necessary degree; and, whenever we have occasion to begin a new parcel of the medicine, we should again commence with the smallest dose, and proceed with the same caution as at first.

We may begin with half a grain of this extract, either formed into a powder with white sugar, or made up with any convenient addition into a pill, twice or thrice a day, and gradually increase the dose: or a tincture of aconite may be prepared, by digesting one part of the dried leaves in six parts of spirits of wine; the dose of which will be at first five or ten drops, and may be gradually increased to forty.

A decoction of the roots of this plant affords an efficacious liquor for destroying *bugs* and will prove fatal to rats and mice.

Acorus Calamus. *Sweet flag.* The root.

The common calamus aromaticus, or sweet flag, grows in marshy situations, and in shallow water, and may be known by its long sword shaped leaves, resembling those of the flag, but narrower, of a brighter green, waved along one of the edges, and also its oblong, cylindric spike of flowers coming from the side of the stem at the edge of the leaf. The root is like that of the flag, long, cylindric, tuburous, spongy, marked with rings, and putting out abundance of fibres, which, indeed, are the proper roots. It has a strong aromatic smell, and a warm pungent, bitterish taste. The flavour is greatly improved by drying.

It possesses carminative and stomachic virtues, and is frequently grated into water and given to children for pain in the stomach and bowels from flatulence. This root is also used as an ingredient in the morning bitters in this country, particularly in places subject to ague.

According to Bechstein, the leaves may be employed for dispelling many noxious insects; hence they are recommended against moths, infesting woollen cloth, and the destructive worms in books; for which purpose they might every year be replaced in the corners of the drawers and shelves. Mr. Bautroh has used the whole plant for tanning leather; and Dr. Bohmer remarks, that the French snuff, called *a la violette*, probably receives its peculiar scent from this fragrant root.

Actea Spicata. *Herb Christopher.* The root.

This vegetable is perennial, growing in woods and shady places. It attains the height of about two and a

half feet, and flowers in the months of May or June; and produces black, shining, pulpy berries in Autumn, about the size of peas, which are considered as poisonous. On account of its fœtid smell, this plant is said to be frequented by toads.

There are two varieties of this plant in the United States; one of which is thus described by Rev. Dr. Cutler. "Christopher baneberries. Blossoms white, berry red. In woodland and shady places—May. The berries are exceedingly poisonous. Dr. Withering says, the plant is powerfully repellent; and that the root is useful in some nervous cases, but it must be administered with caution." Actea racemosa, says Dr. Mease, (Dom. Encyclop.) black snake root, or rich weed, is a very beautiful plant when in flower. The utility of the root of this plant is well known. It is an astringent; and Dr. Barton says, it was used in the form of decoction as a gargle, with success, in a putrid sore throat, which prevailed in New-Jersey, many years ago. A decoction of the root cures the itch. In North-Carolina, it has been useful as a drench in the disease of cattle, called the murrain.

ÆSCULUS HIPPOCASTANUM. *Horse chesnut.* The seed and bark.

This is a very common and well known tree. The fruit is principally farinaceous, and produces excellent starch, and has been used for food for domestic animals, and even for men in times of scarcity. But its introduction into the Edinburgh pharmacopœia was probably owing to its having been used and recommended as a sternutatory in some cases of opthalmia and headach. With this view it was drawn up the nostrils, in the form of an infusion or decoction. The bark has been proposed as an indigenous substitute for the very expensive and often adulterated Peruvian bark. Many successful experiments of its effects, when given internally in intermittent and typhus fever, and also when applied externally in gangrene, sufficiently warrant future trials. In powder, it may be given to the extent of a scruple and a half, or a drachm, for a dose. It rarely disagrees with the stomach; but its astringent effects generally require the use of some aperient medicine. Some species of æsculus are cultivated in the United States, on account of the beauty and agreeable shade of the tree. Medical knowledge might be promoted

were practitioners to try the efficacy of the bark of our native species.

AGRIMONIA EUPATORIA. *Agrimony.* The root.

This is a native of the United States. The number of stamina from five to twelve. Blossoms on long terminating spikes; yellow. By fences—July. It is said the Indians used an infusion of the roots in inflammatory fevers with great success; and, according to Kalm, the Canadians have great confidence in it for the same purpose. The leaves of this vegetable are said to be aperient, detergent, and to strengthen the tone of the viscera; hence they have been used in laxity of the intestines, in scorbutic, and other disorders arising from debility. Digested in whey, agrimony affords a diet-drink grateful to the palate and stomach and was formerly supposed to be an effectual remedy for the jaundice.

The leaves and stalks, together with the closed flowers, afford a dark yellow decoction, which when previously impregnated with a diluted solution of bismuth imparts a beautiful and permanent gold-colour to animal wool.

ALCOHOL. *Ardent Spirit. Spirit of Wine.*

This product is formed during the process of vinous fermentation of sugar dissolved in water, or of saccharine matter in the state in which it exists in sweet vegetable juices. It is the basis of all vinous and ardent spirits, and gives them their peculiar properties—pungency, spirituous flavour, and intoxicating power. It was the opinion of Lavoisier that access of the air to the saccharine matter, was unnecessary to fermentation; and that the water present, was not decomposed, but that the changes, by which alcohol is formed, arise from the immediate reaction of the elements of the saccharine matter, and of the new combinations through which they may pass. These elementary principles, he conceived to be carbon, hydrogen and oxygen. This theory has not been found to be strictly true. In order to excite fermentation in a solution of pure sugar a certain quantity of what is called ferment, is necessary; and sweet vegetable juices undergo this process only from naturally containing this substance. The nature of this ferment has not been explained in a satisfactory manner. It appears to resemble

gluten or albumen in its composition; and in particular contains nitrogen; which Thernard supposes enters into the composition of alcohol. This opinion is corroborated by the analysis of Saussure, which gives the proportion of the elements of alcohol thus. 43,65 carbon, 37,85 oxygen. 14,94 hydrogen and 3,52 nitrogen. It still remains uncertain what proportion of oxygen and hydrogen, exists in alcohol in their elementary state, and what in the state of water. The whole of this subject requires further investigation.

The method of obtaining *spirit* of *wine* or *alcohol* is by submitting the fermented liquor to distillation. It is distilled over with a quantity of water, and thus forms the vinous and spirituous liquors of commerce; these deriving their peculiar flavour from the substances from which the fermented liquor has been prepared. From these liquors alcohol is procured in a more concentrated state by repeated distillation; different substances being added to facilitate the concentration and rectification. The process belongs to pharmacy. Pure alcohol is a colourless transparent fluid; its odour is fragrant, but its taste highly pungent. Its specific gravity is in proportion to its degree of concentration, but as it is usually prepared it is. 835. When of the common strength, it is so volatile as to evaporate speedily at the common temperature; it boils at 160° Fahrenheit, and takes fire when raised to 300°. Alcohol exerts chemical affinities to a number of substances. It unites with water in every proportion; equal quantities of which, by weight, form proof spirits (alcohol dilutum) which is extensively used as a menstruum. It dissolves the pure alkalis, several neutral salts, sulphur and phosphorus; it is likewise the solvent of many of the immediate vegetable principles, as resin. camphor, essential oil, balsam, extract and saccharine matter.

Alcohol is a powerful and highly diffusible stimulant. Taken in moderate quantities it raises the circulations. adds vigour to the muscular system, and exhilarates the mind, but these are followed by proportional languor. If the quantity be considerable, a palsy or apoplexy follows. which frequently ends in death.

It is considered a good application to recent burns, and to inflammations not connected with increased action, and also, with friction, to relieve muscular pains. It is used to excite action in the vessels to prevent passive

hæmorrhage. Alcohol is, however, seldom employed in its pure state, but extensively in the form of vinous and ardent spirits. The wines are more permanent in their stimulant effect than the ardent spirits; hence they are superior in their tonic power, but inferior in producing sudden stimulus.

The spiritous liquors in small quantities prove a powerful cordial, and for a time a strengthening beverage, giving vigour to the stomach, promoting digestion, and preventing flatulence. To the weakly and relaxed they are highly useful by giving elasticity and firmness of tone; but to the rigid habit they are equally pernicious, producing dryness of fibre, and hastening the approach of old age.

From the long continued use of alcohol many diseases have their origin, as dyspepsia, hypochondriasis, visceral obstructions, chronic inflammation of the liver, and gout, morbid states probably arising either from the increased action it excites, giving rise to organic derangements, or from the exhaustion of power, general or local, produced by its stimulant operation.

Allium Sativum. *Garlic.* The root.

Garlic is a perennial, bulbous rooted plant, all the parts of which, but more especially the roots, have a strong, offensive, very penetrating and diffusive smell, and an acrimonious taste. It is a powerful and diffusive stimulant; hence in cold phlegmatic habits, in rheumatalgia, catarrhous disorders of the breast, asthma, both pituitous and spasmodic, flatulent colics, hysterical and other diseases proceeding from laxity of the solids, garlic is eminently serviceable, proving expectorant, diuretic, and if the patient be kept warm, sudorific. Sydenham extols it in hydropic cases; and assures us also, that, among all the substances which occasion a derivation or revulsion from the head, no one operates more powerfully than garlic applied to the soles of the feet. In hot bilious constitutions, where there is already a degree of irritation, where the juices are too thin and acrimonious, this stimulating medicine is obviously improper, and never fails to aggravate the distemper. Garlic may be exhibited in substance, several cloves of it cut into slices may be swallowed without chewing. In this manner it has been successfully directed for the cure of intermittent fever;

but the most commodious form for administering it, is that of bolus or pill; the expressed juice, or even the infusion, is too acrimonious for common use. Cotton moistened with the juice and introduced within the ear five or six times in a day, has afforded relief in deafness proceeding from atony or rheumatism. In the form of ointment applied externally, garlic is said to resolve and discuss indolent tumors; and when applied under the form of poultice to the pubes, it has some times proved effectual in producing a discharge of urine, when its retention has arisen from want of due action of the bladder.

ALOE PERFOLIATA. *Aloes.* The gum resin.

a. Aloe hepatica—Hepatic aloes.
b. Aloe socotorina—Socotorine aloes.

A perennial plant consisting of many varieties, which grows in the south of Europe, Asia, Africa, and America. The various kinds of aloes differ in their purity, and likewise in their sensible qualities. The *socotorine* is considered as the purest, and is brought from the island of Socotora, wrapped in skins. It is in small pieces of a redish brown colour, with a purplish cast; when reduced to powder, of a bright golden shade. Its taste is bitter, accompanied with an aromatic flavour; the smell is not unpleasant, and slightly resembles that of myrrh. The *Barbadoes* aloes is in large masses, of a lighter colour, and has an odour much stronger, and more unpleasant than the former. The *hepatic* is of a similar kind. The *caballine* or horse aloes, is still more impure, and is weaker in its power. They are all the inspissated juice of the several varieties of the aloe plant. They consist of gum and resin, the former being in larger quantity. The smell and taste reside principally in the gum, as do the principal virtues of the aloes. Aloes is a warm, stimulating purgative, used principally to obviate costiveness. Its medium dose is from five to fifteen grains, nor does a larger quantity operate more effectually. Its operation is exerted upon the large intestines, principally on the rectum, and hence its purgative effect is slow and moderate. It has been supposed that the stimulant action of aloes may be extended to the uterus, whence it is also used as an emmenagogue; but its exhibition is deemed improper during pregnancy. It has also been supposed, that its use is apt to induce or aggravate hæmorrhoidal

affections, and with those liable to such complaints, it can seldom be employed. In dry bilious habits, aloes proves injurious, immoderately heating the body, and inflaming the bowels. In small doses frequently repeated, aloes cleanses the stomach and bowels, attenuates and dissolves viscid juices in the remoter parts, quickens the circulation, warms the habit, and promotes the uterine and hæmorrhoidal fluxes. It is particularly serviceable to persons of a phlegmatic temperament and sedentary life, and where the stomach is oppressed and weakened. Taken in doses of a few grains, mixed into pills, with a third or equal parts of soap, it acts as a gently stimulating laxative, and if continued, is capable of removing very obstinate obstructions. On account of its bitterness, aloes has been supposed to kill worms, either taken internally, or applied in the form of plaster to the umbilical region. Dissolved in alcohol, it is also employed for restraining external hæmorrhages, and for cleansing and healing wounds and ulcers.

ALTHÆA OFFICINALIS. *Marsh Mallow.* The root and leaves.

The marsh mallow is a handsome perennial indigenous plant growing in salt marshes and on the banks of rivers and other wet places. It is also cultivated in gardens for its medical virtues. The upright cylindrical stem rises to three or four feet; is somewhat branched and cottony. The leaves are on leaf stalks, egg-spear shaped, obscurely lobed, serrated, and have a soft woolly surface, feeling like velvet. The flowers appear in August, from the bosom of the leaves on fruit stalks in a kind of panicle, and are of a white or pale flesh colour. Every part of the marsh mallow, and especially the root, upon boiling, yields a copious mucilage; on account of which, it is frequently employed in emollient cataplasms, and by way of infusion. In humid asthma, hoarseness, dysenteries, and likewise in nephritic and calculus complaints, it is of eminent service; as by lubricating and relaxing the vessels, it procures a more easy passage to the stagnant fluids. It is with equal advantage applied externally, for softening and maturating hard tumors, and when chewed, it is said to afford relief in difficult teething. An ointment and syrup are made from the roots of this plant.

AMMONIACUM. *Ammoniacum.* A gum resin.

This gum resin is brought from Egypt, and the East Indies; the tree which produces it is unknown. It comes in large masses, or, when of the best quality, in small round fragments, yellow on the surface, and white within. It has a faint smell, and a nauseous taste. It contains nearly half its weight of resin, which is dissolved by alcohol. Triturated with water, it forms a milky like mixture. The general action of gum ammoniac is stimulant. On many occasions it proves a valuable antispasmodic, deobstruent, or expectorant. In large doses it purges gently, excites perspiration, and increases the flow of urine. It is prescribed for removing obstructions of the abdominal viscera, and in hysterical complaints, occasioned by a deficiency of periodical evacuations, and in long and obstinate colics, proceeding from viscid matter lodged in the intestines. But it is no less frequently resorted to as an expectorant, in cases where the lungs are oppressed with tenacious phlegm, as in asthma, and chronic catarrh. In this last disease, if the cough continue dry and husky, without expectoration, and fatigue the breast, provided there be no apprehension of tubercles, there is not, perhaps, a more efficacious remedy for it, than half a drachm of gum ammoniacum, with twenty drops of liquid laudanum, made into pills, taken at bed time, and occasionally repeated. This excellent remedy was recommended by Sir John Pringle; and Dr. Mudge observes, that he has in many instances found it very successful, and generally expeditious; almost uniformly producing expectoration, and abating the distressing fatigue of the cough. This gum, combined with squills, is used as a diuretic in dropsical affections, in doses from ten to thirty grains. Externally, it is applied as a discutient, under the form of plaster, to white swellings of the knee, and to indolent tumors.

AMOMUM ZINGIBER. *Ginger.* The root, and the candied root brought from India.

Ginger is a perennial shrub, which grows about three feet high, indigenous to the East Indies, but now cultivated in the West Indies. It is in small wrinkled pieces, of a grayish, or white colour, having an aromatic odour,

and a very pungent, and even acrid taste. The black ginger, is the root prepared with less care than the white, which, previous to drying, is scraped and washed. Ginger yields its active matter completely to alcohol, and in a great measure to water. This root is frequently employed as a grateful and moderately powerful aromatic, either in combination with other remedies, (to promote their efficacy, and obviate symptoms arising from their operation,) or by itself, as a stimulant, particularly in dyspepsia, flatulence, tympanites, and gout. This spicy root is more immediately serviceable in cold flatulent colics; in laxity and debility of the stomach and intestines, and especially in torpid phlegmatic constitutions, in order to induce a more brisk action of the vessels. Candied ginger is prepared in India, from the young and succulent roots. When genuine, it is almost transparent.

AMOMUM REPENS. *Lesser Cardamom.* The seeds.

The seeds of this plant are dried and imported from India in their capsules, by which their flavour is better preserved. Their smell is aromatic; their taste pungent. They are used merely as grateful aromatics, and are frequently combined with bitters. These seeds are said to possess this advantage over the pepper species, that notwithstanding their pungency, they do not immoderately heat, or inflame the bowels.

AMYGDALUS COMMUNIS. *The Almond Tree.* The kernel of the fruit, such as is called sweet almond.

The almond tree is eminent, both for its fruit, and for the ornament it affords to a shrubbery. It is much cultivated in the south of Europe. Sweet almonds are supposed to afford but little nourishment, and are not easily digested, unless thoroughly comminuted. The oil is obtained by expression from the seeds, or by decoction. It is very similar to olive oil, but more pure, and is given to blunt acrimonious humours, and to soften and relax the solids; hence its use internally in tickling coughs, heat of urine, pains and inflammations; and externally, in tension and rigidity of particular parts. There is another mode in which this oil is given as a demulcent; that of emulsion. The almonds are triturated with water; the oil they contain is diffused in the water, by the medium of

the mucilage of the almond, and a milky like liquor is formed, which is extensively used as a pleasant demulcent.

AMYRIS GILEADENSIS. *Balsam of Gilead Tree.* The liquid resin, called Balsam of Gilead.

This is a resinous juice, obtained from an ever-green tree, growing spontaneously, particularly near Mecca, on the Asiatic side of the Red Sea. This balsam, procured by incisions made in the trunk of a tree, is highly fragrant, and is so much valued in the East, that it is said not to be imported into Europe. A coarser kind is met with, obtained by strong decoctions of the branches and leaves, and adulterated by various mixtures. This is of a yellow colour, and thick consistence; its taste is warm and bitter; its flavour somewhat fragrant. The medicinal virtues of the genuine Balsam of Gilead, have been very highly rated, undoubtedly with much exaggeration. But the real opobalsam, or Balm of Gilead, frequently mentioned in scripture, is not to be obtained in its genuine state, as it is presented only to sovereign princes: nor need it be regretted, since it is now entirely superseded by the balsams of Canada and Copaiba, which are equally efficacious.

ANETHUM FŒNICULUM. *Fœniculum dulce.* Sweet fennel. The root and seeds.

This is a perennial plant, of which there are four varieties. One of these, the common fennel, is indigenous on chalky cliffs in England. The sweet fennel, the variety of which is officinal, grows wild in Italy, but is also cultivated in gardens. It is smaller in all its parts than the common, except the seeds, which are considerably larger. The seeds of the two sorts differ likewise in shape and colour. Those of the common are roundish, oblong, flatish on one side, and protuberant on the other, of a dark, almost blackish colour; those of the sweet are longer, narrower, not so flat, generally crooked, and of a whitish or pale yellowish colour. The seeds of both the fennels have an aromatic smell, and a moderately warm pungent taste: those of the *fœniculum dulce* are in flavour most agreeable, and have also a considerable degree of sweetness. The seeds yield an excellent aro-

matic oil, which is carminative, resolvent, and diuretic, without heating the body.

ANETHUM GRAVEOLENS. *Dill.* The seeds.

Dill is an annual umbelliferous plant, cultivated in gardens, as well for culinary as medical use. The seeds are of a pale yellowish colour, in shape nearly oval, convex on one side, and flat on the other. Their taste is moderately warm and pungent; their smell aromatic, but not of the most agreeable kind. The seeds are recommended as a carminative in flatulent colics.

These seeds, with those of cummin, possess qualities and virtues similar to those of the anise and caraway, and are used for similar purposes, but are scarcely entitled to a place in the materia medica. Cummin however affords an oil peculiarly grateful to wild pigeons, and is frequently resorted to by the people in the country as a lure for those birds to the stand of the gunner.

ANGELICA ARCHANGELICA. *Garden Angellica.* The roots, stalks, leaves, and seeds.

Angelica is a large biennial umbelliferous plant. It grows spontaneously on the banks of rivers in alpine countries. It has been found in England, but it is doubtful whether it be indigenous. For the use of the shops, it is cultivated in gardens in different parts of Europe. The stalk of this magnificent plant, when properly cultivated in a moist soil, rise to the height of seven or eight feet; its flowers are of a greenish white colour, or sometimes yellow. Every part of this useful vegetable, the root, stalk, leaves, and seeds, partake of the aromatic properties, and were formerly supposed by European physicians to be well calculated to strengthen the solids, and especially serviceable for dispelling flatulency, removing pectoral complaints, and affording effectual relief in hysterics. Dr. Duncan says, angelica is one of the most elegant aromatics of European growth, though little regarded in the present practice. Among the several species of angelica in the United States, we have *Angelica Sylvestris*, or wild angelica, which is a much smaller plant, of a thinner and less succulent stem than the former. It grows in marshy woods and in hedges, flowers in June or July. This species however, possesses, but in

an inferior degree, the medicinal properties of the preceding. Being warm and aromatic, it is frequently employed in flatulent colics, and its stems are sometimes candied by the country people. The leaves of wild angelica yield a good yellow colour to wool properly prepared by a solution of bismuth.

Angustura. *Angustura.* The bark.

This is a bark imported within these few years from the Spanish West Indies; the botanical character of the tree producing it is unknown. It is in flat pieces, externally gray and wrinkled; internally, of a yellowish brown, and smooth; has little flavour; its taste is bitter, and slightly aromatic. Water, assisted by heat, takes up the greater part of its active matter, which does not seem to be injured, even by decoction. Alcohol dissolves its bitter and aromatic parts, but precipitates the extractive matter, dissolved by water. Proof spirit is its most proper menstruum. Angustura is a powerful antiseptic. It was originally introduced in the West Indies, as a remedy in fevers, equal, or even superior, to the Peruvian bark. As an aromatic bitter, it has been found to be a tonic and stimulant of the organs of digestion. It increases the appetite, removes flatulence and acidity arising from dyspepsia, and is a very effectual remedy in diarrhœa, from weakness of the bowels, and in dysentery; and it possesses the singular advantage of not oppressing the stomach, as Peruvian bark is apt to do. Its dose is from ten to twenty grains of the powder, or one drachm in infusion, or decoction. Its tincture, in a dose of one or two drachms, has been used in dyspepsia. It proves ineffectual as a remedy in intermittents.

Anthemis Nobilis. *Chamomile.* The flowers.

Chamomile is a perennial plant, indigenous to the south of England, but cultivated in gardens for the purposes of medicine. The flowers have a strong, not ungrateful aromatic smell, and a very bitter nauseous taste. Their active constituents are bitter extractive, and essential oil. To the latter is to be ascribed, their antiseptic, carminative, cordial, and diaphoretic effects; to the former, their influence in promoting digestion. Chamomile flowers are a very common and excellent remedy, which is often used

with advantage in spasmodic diseases, in hysteria, in spasmodic and flatulent colics, in suppression of the menstrual discharge, in the vomiting of puerperal women, in after pains, in gout, in intermittents, and typhus. From its stimulating and somewhat unpleasant essential oil, chamomile is also capable of exciting vomiting; and a strong infusion of the flowers is often used to promote the action of other emetics. In substance, it has been frequently given as a remedy in intermittent fever, in a dose of a drachm, or more, three or four times in the day. Chamomile flowers are applied as a discutient and emollient, in the form of clyster or fomentation, in colic, dysentery, strangulated hernia, &c.

Aqua. *Water.*

Pure water is defined, a liquid, transparent, colourless, insipid substance. By a moderate degree of cold, it is converted into a solid, transparent body, called ice; and at a temperature of 212° of Fahrenheit's thermometer, it becomes rarified, is augmented in bulk, and quickly dispersed in the form of vapour. It is diffused through the atmosphere, and over the surface of the globe; and exists in a certain proportion, in animals, vegetables, and minerals. Till the latter end of the eighteenth century, it was generally believed to be a simple element; and, the late discovery of its being a compound, is considered as one of the most important and astonishing, that has been made since the origin of chemical science. By a variety of chemical experiments, the fact has been demonstrated beyond controversy, that water consists of 85 parts of oxygenous, and 15 of hydrogenous gas.

All natural waters are more or less impure; having a strong attraction for different substances, they imbibe part of them in every situation in which they are found. Water cannot be obtained in a pure state, without undergoing the process of distillation. Its salubrity depends on the peculiar properties which it possesses. Some waters are strongly impregnated with animal, vegetable, or mineral particles, which render them unfit for culinary purposes. Pure water has neither smell, nor taste, and is perfectly transparent. If water be of a brown colour, some extraneous substance is diffused through it; if of a green colour, it indicates the presence of iron; and, if blue, that of copper. If, on agitation, air-bubbles appear

in the water, and if it have a mild sourish taste, we may be sure that it contains carbonic acid gas, or fixed air.

Atmospheric water comprehends *rain* and *snow water;* the former is that which was evaporated from the sea and land, dissolved in the air, and afterwards discharged on the earth. It would be as pure as distilled water, if the atmosphere did not abound with vapours and exhalations, capable of combining with it. The rain, which is collected from the roofs of houses in large cities, is always mixed with soot, animal effluvia, and other impurities. *Snow water* is contaminated with the same impurities as rain water, and it is probably from the want of common air, or of carbonic acid, that snow water is injurious to health.

River water may be considered as a compound of spring and rain water. Near great cities, particularly, it is blended with a number of impurities; but by the process of filtration, it becomes fitted for every purpose of life; and it is preferred for brewing, or forming malt-liquor. It is also more or less wholesome according to the particular strata it flows over; as from a sandy or stony soil it attracts less impurity than from a soft muddy one; and the more rapid its course, the sooner it frees itself from those adventitious particles which taint its natural wholesomeness.

Spring Water is a compound of sea-water changed by subterraneous heat, and of the vapours of the atmosphere. It is, indeed, always impregnated more or less with mineral substances, which must be noxious to a certain degree. But, like river-water, the strata through which it rises, must in a great measure regulate its qualities.

Well or *pump water*, is much of the same nature with spring water, but it generally receives a fuller or more complete filtration from the manner in which it is procured. Where the filtration is through a sandy soil the water is purest, and the more frequently a well is emptied, the less chance there is of the water acquiring a putrid taint by stagnation.

Stagnant waters, as those of lakes, swamps, and ditches, are the most unwholesome of any, as they both collect impurities from their situation, and acquire from their want of motion a disposition to putrescency; and they are the fruitful source of contagion.

Water is an essential constituent in the organization of all living bodies; and as it is continually expended during

the process of life that waste must be also continually supplied, and this supply is of such importance, that it is not left to reason, or to chance, but forms the object of an imperious appetite. Experience clearly evinces that it is the most healthy and natural beverage of mankind; and, as the basis of all drinks, deserves the title of an universal remedy more than any other substance with which we are acquainted. It is the most powerful solvent of alimentary matter we possess; and without it, neither life nor health could be maintained. Nor is it less powerful in disease, especially as a diluent in febrile affections. In fine, where custom has not altered the constitution of man, it forms the most salubrious of all drinks, and those, who have made it their constant and only beverage, have enjoyed a constant health, a flow of spirits, and a length of life, superior to all others. As a medicinal agent in the various forms of its application to diseases, water is highly deserving the attention of practitioners. When taken into the stomach, water acts by its temperature, its bulk, and the quantity absorbed by the lacteals. The colder it is, the more tonic and invigorating it proves; while warm water is on the contrary the most sedative and debilitating of drinks. Water about 60° gives no sensation of heat or cold; between 60° and 45° it gives a sensation of cold, followed by a glow and increase of appetite and vigour; below 45° the sensation of cold is permanent and unpleasant, and it acts as an astringent and sedative; above 60° it excites nausea and vomiting, probably by partially relaxing the fibres of the stomach, for when mixed with stimulating substances it has not these effects. In the stomach and in the intestines it acts also by its bulk, producing the effects arising from the distention of these organs; as the intestinal gases consist of hydrogen gas, either pure or carbonated, or sulphuretted, or phosphuretted, it is probably in part decomposed in them. It likewise dilutes the contents of the stomach and intestines, thus often diminishing their acrimony. It is absorbed by the lacteals; dilutes the chyle and the blood; increases their fluidity; lessens their acrimony, and produces plethora. Its effects in producing plethora and fluidity are however, very transitory, as it at the same time increases the secretion by the skin and kidneys. Indeed the effects of sudorifics and diuretics depend in a great measure, on the quantity of water taken along with them.

When spring waters possess any peculiar character they are called *mineral waters*, and these as having a specific action depending on the foreign substances which they contain, will be more particularly investigated and considered in the appendix of this work.

Some water, possessing the quality of hardness, does not readily dissolve soap, nor boil vegetables soft, nor make an infusion of tea. It generally contains some acid, combined with an absorbent earth, for which the acid has less attraction than for the alkali of the soap. When soap is put into such water, its alkali is immediately attracted by the acid, the soap is decomposed, and the oil swims on the surface.

From the influence of the animal and vegetable substances which it contains, water is extremely liable to become putrid on long voyages; in this state it is in a high degree pernicious to the human frame, and capable of producing mortal diseases, even by its effluvia. Various expedients have been devised to keep it in a state of purity. Dr. Butler has found, that four ounces of fine clear pearl ash, dissolved in 100 gallons of water, and the cask closed in the usual manner, have proved effectual for preserving water perfectly sweet, during a voyage of eighteen months. The same desirable object may be attained, by adding a small portion of vitriolic acid and of alkali to every cask; which will preserve the water in a pure and salubrious state, for at least twelve months. Charcoal has also proved to be eminently adapted to such purpose. With this view the inner surface of the staves are charred previously to constructing the casks. Putrid water may be restored to its original purity, by adding to each gallon ten grains of calcined alum, and twenty five or thirty of powdered charcoal; both ingredients, however, ought to be preserved in close vessels, otherwise their efficacy will be considerably diminished. The same purpose may be effected, according to the experiments of Mr. Lowitz, by charcoal and vitriolic acid: one ounce and a half of charcoal in powder, and twenty-four drops of vitriolic acid, are sufficient to purify three pints and a half of corrupted water, and do not communicate to it any perceptible acidity.

Putrid water may be restored to its original purity, by filtering it through sand and charcoal. Several filtering machines have been invented admirably calculated to

facilitate this process; and repeated experiments have demonstrated their great utility.

ARALIA SPINOSA. *Prickly-ash. Toothach tree.* The bark, root, and berries.

This is a native of Virginia, and other southern states. The height to which this tree will grow, when the soil and situation wholly agree with it, is about twelve feet. It is a very ornamental shrub, and the stem which is of a dark brown colour is defended by sharp prickly spines. A decoction of its bark and root has often succeeded, when taken internally, in removing rheumatic complaints. It excites a gentle perspiration. The berries are used to put into a hollow tooth when aching. A tincture of them is also used for the same purpose, both of which afford relief. In Virginia a spirituous infusion of the berries is much esteemed in violent colic.

ARBUTUS UVA URSI. *Bearberry. Bear's Whortleberry.* The leaves.

The uva ursi is a low shrub, somewhat resembling the myrtle. The leaves have a bitterish, astringent taste; and their astringent qualities are so considerable, that in certain places, particularly the provinces of Russia, they are used for tanning leather. A watery infusion of the leaves, immediately strikes a very black colour with chalybeates. Dr. de Haen of Vienna, has bestowed very high encomiums on the uva ursi, against ulcerations of the kidneys, bladder, and urinary passages. He represents it as capable of curing almost every case of that kind; and even asserts, that in cases of calculous, much benefit is derived from its use; patients, after the employment of it, passing their urine without pain. It has not however answered the expectations, which, on these grounds, other practitioners formed of it. But in many affections of the urinary organs, it has proved to be a remedy of considerable use; and it has been particularly serviceable in alleviating dyspeptic symptoms in nephritic and calculous cases. From its astringency, uva ursi has been employed in menorrhagia, and other fluxes, but more particularly in cystirrhœa, calculus, diabetes, and ulcerations of the urinary organs, in some of which affections, its efficacy is greater than has of late been allowed. Professor Barton

of Philadelphia, from long experience of its efficacy, is high in its commendation, in cases of nephritis depending on gout, and has found it serviceable in old gonorrhœa. It is sometimes exhibited in the form of decoction, but most frequently in that of powder, from a scruple to a drachm for a dose, repeated twice or thrice in a day.

In the New-England states, and in New-York and New-Jersey, the uva ursi, a low ever-green shrub, is found in great abundance trailing on the ground in dry, sandy soils, in woods, and on mountains. The inhabitants, to whom it is known by the name of *wild cranberry*, have recourse to it with much confidence, as a remedy, under various circumstances attending affections of the urinary organs.

More lately it has been recommended in phthisis, and it is probable deserving of trial. For medicinal use the green leaves alone should be selected and picked from the twigs, and dried by a moderate exposure to heat.

ARCTIUM LAPPA. *Burdock.* The root and seeds.

This is a common plant about way-sides, sufficiently known from its scaly heads, or burs, which stick to the cloths. It bears purplish blossoms in July and August. The seeds have a bitterish subacrid taste: they are recommended as very efficacious diuretics, given either in the form of emulsion, or in powder, to the quantity of a drachm. The roots are esteemed aperient, diuretic, and sudorific; and are said to act without irritation, so as to be safely used in acute disorders. Decoctions of them have of late been employed in rheumatic, gouty, and venereal disorders, and are by some preferred to sarsaparilla.

ARGEMONE MEXICANA. *Prickly Poppy.*

We are indebted to Solomon Drown, M. D. an accomplished botanist, of Rhode Island, for the following account and description of a plant lately introduced into his garden.

This fine American plant has a singular appearance, with its spinous leaves deeply indented, and streaked with white; its prickly stems and calyx, its yellow solitary flowers, and spinous capsules. It abounds with a milky glutinous juice, turning in the air, into a fine bright

yellow, and not distinguishable from gamboge; said to be efficacious, in small doses, in dropsies, jaundice, and cutaneous eruptions; deemed to be very detersive, and used in diseases of the eyes, the infusion is sudorific and resolutive; the seeds are a stronger narcotic than opium, and frequently administered in the sugar colonies in diarrhæas and dysenteries. In the West Indies it is called the yellow thistle. This appears to be a hardy annual, and without doubt can be cultivated easily in the United States.

Argentum. *Silver.*

This metal is distinguished by its pure white colour, its high degree of lustre, and its great ductility and malleability. It is not very susceptible of oxidation; it does not suffer that change from exposure, even in a state of fusion, to the atmosphere. Those acids which yield oxygen readily oxidate and dissolve it, particularly nitric acid, which is hence employed as its usual solvent. The solution, when evaporated, affords the nitrate of silver in a crystaline form.

Aristolochia Serpentaria. *Virginia Snake Root.*

The root.

A perennial medicinal plant, and a native production of the United States exclusively. The root consists of a number of small strings or fibres, matted together, issuing from one head, of a light brown colour, having a slightly aromatic smell and a pungent bitterish taste. This root is a warm stimulant, both diaphoretic, and diuretic, and esteemed one of the principal remedies in malignant fevers to support the powers of the system. It increases the pulse very perceptibly, and is improper whenever bleeding is required. It is given in substance in doses of from twenty to thirty grains, and in infusion to a drachm or more, or it may be administered in tincture, its active matter being entirely extracted by proof spirit. By decoction, its powers are entirely destroyed. This root promotes the efficacy of cinchona in the cure of intermittents, and remittents, and is a remedy of considerable power in dyspepsia. Combined with *calamus aromaticus*, and infused in spirits, or water, it forms the common morning dram in aguish situations. Externally, it is used as a gargle, in putrid sore throat.

Artemisia Abrotanum. *Southernwood.* The leaves.

Artemisia Santonica. *Wormseed.* The top and seeds.

Artemisia Absinthium. *Common Wormwood.* The leaves and flowering heads.

The two former of the several species of artemisia, are still regarded as articles of the Materia Medica, although no important effects are expected to result from any medicinal virtues which they may possess. The seeds of santonica have a faint disagreeable smell and a very bitter taste. They have long been held in estimation as anthelmintic; the dose, half a drachm or a drachm of the powder, for an adult. They are given to children in powder, to the extent of ten grains or half a drachm, in the morning, when the stomach is empty; and when continued for several days, a proper cathartic is administered. The *absinthium* or *common wormwood*, is a perennial herb, growing wild on the road sides, and is cultivated in gardens. It flowers in August; the smell of the leaves is strong and disagreeable; their taste intensely bitter. The active constituents of this plant, are bitter extractive and essential oil. It is used in stomach complaints, and is of great service to hypochondriacs. It is also employed in intermittent fevers, in cachectic and hydropic affections, in jaundice, and against worms. According to Dr. Withering, an infusion of the leaves is a good stomachic, and, with the addition of fixed alkaline salts, proves a powerful diuretic in some dropsical cases.

Their ashes produce a purer alkali, than most other vegetables. The essential oil, is used both externally and internally, for destroying worms. The herb, being an excellent antiseptic, is often employed in fomentations, to resist putrefaction; and if the plant be macerated in boiling water, and repeatedly applied to a bruise, by way of cataplasm, it will not only speedily remove the pain, but also prevent the swelling and discolouration of the part.

Arum Americanum. *Cales.* } *Skunk Cabbage.*
Dracontium Fœtidum. *Linn.* } The root and seeds.

This singular plant abounds in the swamps and meadows throughout New-England, and is found native in

North America only. The vulgar name by which it is here generally known is taken from its very rank and disagreeable smell, nearly resembling that of a skunk, or pole cat, and from its leaves resembling those of the cabbage. It is considered as a species of arum, the roots and seeds when fresh, impart to the mouth a sensation of pungency and acrimony. But according to Dr. Cutler the fructification so essentially differs from all the genera of the order, it must undoubtedly be considered as a new genus. This plant has no stem, and the flower is the first part that appears in April and May. The leaves next appear at a small distance from the flower stalk in a conic form, very closely rolled together, expanding nearly ovate as they rise, supported on foot stalks. The calix consists of a very large, permanent *spatha*, of a thick porous substance, approaching to an ovate form; open on one side and bellied out on the opposite; the margin auriculated at the base, and somewhat twisted at the apex. The *spadix* within the *spatha*. The florets numerous, placed around the receptacle in an oval form: and are so compact as to appear like a solid body, thick set with small regular protuberances on its surface. Corolla four erect, very thick, narrow obtruncated petals. *Stamin* four flattish filaments rising from the receptacle; longer than the corolla. *Antheræ* oblong. *Germen* convex. Style cylindrical; rather longer than the stamina. Stigma bifid. Seeds large, roundish; single; inclosed within the receptacle. The globe of flowers is nearly of the colour of the spatha, which is beautifully variegated with scarlet and yellow.

This valuable domestic article is found to be well deserving of a place in our Materia Medica, and may be ranked high in the class of antispasmodics. The roots dried and powdered have proved of excellent use in asthmatic cases, and often afforded relief in this distressing disease when other means are ineffectual. It should be exhibited during the paroxysm, and repeated as circumstances may require, in doses of thirty or forty grains. It will be proper to persevere in the use of it for some time after the paroxysm has gone off, or till the patient is perfectly recovered, which is said to have been the method pursued by the Indians for the cure of this disease. The Rev. Dr. Cutler has announced his opinion of its efficacy as experienced in his own particular case after other remedies had disappointed his expectations. The

antispasmodic powers of the scunk cabbage root have been displayed when prescribed in other diseases. In one of the most violent hysteric cases I ever met with, says a correspondent, where the usual antispasmodics and even musk had failed, two tea-spoons full of the powdered root in spirits and water procured immediate relief, and on repeating the trials with the same patient, it afforded more lasting benefit than any other medicine. In those spasms frequently affecting the abdominal muscles in parturition, he adds, it produces the desired effect in doses of one tea-spoon full repeated occasionally. In numerous other instances of spasmodic affection, and also in chronic and acute rheumatism, this root either in powder or decoction has evinced its efficacy, and performed important cures, as attested by good authority, in confirmation of my own experience. Two instances have been stated in which this medicine has been supposed to be remarkably efficacious in the case of dropsy; two tea-spoons full of the powdered root being taken every morning successively till the cure was effected. The seeds of this plant are said by some to afford more relief in asthmatic cases than the root. A caution is suggested by Dr. Cutler, that in collecting the roots, the *white hellebore* or *poke root*, which some people call scunk weed, be not mistaken for this plant, as the consequence might be fatal. There is an obvious distinction; the hellebore has a stalk, but the scunk cabbage has none; and the roots of the latter are much larger than those of the former.

ARUM MACULATUM. *Wake Robbin, Cuckow Pint, or Dragon Root.* The root and leaves.

A native and hardy perennial, growing in shady places, ditch banks, and rough ground. Early in the spring it pushes up a one leafed conical shaped spatha, under hedges and among bushes; within this spatha, is a spadix, naked on the under part, covered with germs at the bottom, and with anthers in the middle. As the plant advances the spatha opens, and discovers a club shaped spadix, varying from yellowish green to fine purple or red. This gradually decays and leaves a cluster of round red berries, which, as well as the rest of the plant, are very hot and biting. The leaves are generally spotted with black spots, and sometimes with white streaks, which has occasioned the vulgar name of lords and ladies. The root is bulbous,

resembling in shape a small turnip, and in a fresh state is extremely acrid. When dried and pulverized, these roots lose all their acrimony, and afford an almost tasteless farinaceous white powder. In this state it is perfectly inert, but the roots may be preserved fresh for a year by burying them in a cellar in sand.

Arum is doubtless a very powerful stimulant, and by promoting the secretions, may be advantageously employed in cachectic and chlorotic cases, in rheumatic affections, and other complaints of phlegmatic and torpid constitutions; but particularly in a relaxed state of the stomach, occasioned by a prevalence of viscid mucus. In chronic rheumatism, and other disorders requiring the full effect of this medicine, great care should be taken, that the root be fresh and newly dried; and to cover its intolerable pungency, Dr. Lewis advises it to be administered in the form of emulsion, with gum arabic and spermaceti, increasing the dose from ten grains to upwards of a scruple two or three times in a day. The French manufacture from the arum root, when properly dried and reduced to powder, a harmless cosmetic, which is sold at a high price under the name of cypress powder.

ARUM TRIPHYLLUM. *Indian Turnip.* The root.

The acrimony of the recent root of this plant is well known. By drying, much of this is lost. It has been very beneficial in asthma, especially in old people; in croup and hooping-cough. The recent root boiled in lard, to the consistence of ointment, has been found useful in tinea capitis. The dried root boiled in milk, in the proportion of one root to a half pint, has been advantageously employed in consumption. Some acrimony should be perceptible to the tongue and throat in its exhibition. It never affects the general circulation, says Dr. Mease, but acts solely on the parts just named; to the glands of which it is a powerful stimulus, causing a copious secretion of mucus. A fine sago has been prepared from the roots, in the proportion of one part to four of the root, freed from its exterior coat.

ASARUM EUROPÆUM. *Asarabacca.* The leaves.

This is a perennial plant, which is the natural produce of some places in England: although the dried roots are

generally brought from the Levant. The root is fibrous, of a grey-brown colour externally, but white within. Both the roots and leaves have a nauseous, bitter, acrimonious, and hot taste; their smell is strong, but not very disagreeable. Asarabacca contains a portion of the same acrid principle with arum, and it also loses much of its activity, by decoction, or long keeping. Given in substance, from half a drachm to a drachm, it evacuates powerfully, both upwards and downwards. Linnæus proposed it as a substitute for ipecacuan, and according to Dr. Cullen, the powdered root proves, in a moderate dose, a gentle emetic. But the principal use of this plant, among modern practitioners, is a sternutatory, being the strongest of all the vegetable errhines, not excepting white hellebore itself. Snuffed up the nose, in the quantity of a grain or two, it causes a large evacuation of mucus, and raises a plentiful spitting, which sometimes continues several days together: and by which headach, toothach, ophthalmia, as well as some paralytic and soporific complaints, have been effectually removed. Several species of asarum have been found to grow in the United States; as the Canadian asarum, called also wild ginger; and the asarum virgineum, or sweet scented asarum or cat's-foot. Experience has in some instances demonstrated their characteristic properties, and they are deserving further trial.

ASCLEPIAS DECUMBENS. *Decumbent swallow-wort. Pleurisy root. Butterfly-weed.* The root.

This species of swallow-wort is one of our most beautiful perennial plants, flourishing best in a light sandy soil, by the way side, under fences, and near old stumps in rye fields, &c. It abounds in the southern states, but with us is not so frequently found. There are sometimes fifteen or twenty, or more stalks, the size of a pipe stem, proceeding from one root, rising from one to two feet in height, and spreading to a considerable extent, generally in a decumbent position. The stalks are round and woolly, of a reddish brown colour on the sun side; the leaves stand irregularly, and are spear, or tongue shaped, with a short foot stalk, and covered with a fine down on the under surface. The umbels are compact at the extremities of the branches, and formed like the common silk weed, but differing from it in the colour of the flowers, being of a beautiful bright orange colour, while those

of the silk weed are of a pale purplish hue. The flowers appear in July and August, and are distinguished by their size and brilliancy from all the flowers of the field. These are succeeded by long slender pods, containing the seeds, which have a delicate kind of silk attached to them. This is probably the only variety of asclepias that is destitute of a milky juice. The root is spindle, or carrot shaped, of a light brownish colour on the outer surface, white coarse and striated within. The root of this plant is a valuable addition to our Materia Medica, having been found to possess medicinal virtues of no inconsiderable importance. It has been long celebrated in Virginia and the Carolinas, as a remedy in pleurisy, and in pneumonic affections in general. It is said to display a remarkable power of affecting the skin, inducing general and plentiful perspiration without heating the body. In the form of decoction it often induces a diaphoresis when other medicines have failed to produce that effect. We have the testimony of Professor Barton in favor of the great efficacy of this medicine in pulmonic affections. He corroborates the account published by Mr. Thompson Mason, of Virginia, whose experience of its virtues in pleurisy has been so extensive as to establish its reputation. After the use of an antimonial emetic and the loss of some blood, he gives his patients about half a drachm of the root finely powdered in a cup of warm water, and repeats the dose every two hours until the patient is perfectly recovered, which happens frequently in three days. Mr. Mason asserts that by those simple means he has cured hundreds, and never failed in a single instance. The powdered root frequently acts as a mild purgative, but it is particularly valuable for its virtues as an expectorant, diaphoretic, and febrifuge, and in this respect its efficacy is amply confirmed by the testimony of Dr. Benjamin Parker, of Bradford, Massachusetts, from his own observation during an extensive practice for many years in Virginia. From the successful employment of the pleurisy root for twenty-five years, this respectable physician has imbibed such confidence, that he extols it as possessing the peculiar, and almost specific quality of acting on the organs of respiration, powerfully promoting suppressed expectoration, and thereby relieving the breathing of pleuritic patients in the most advanced stage of the disease; and in pneumonic fevers, recent colds, catarrhs and diseases of the breast in general, this remedy has in his

hands proved equally efficacious. He directs it to be given in the form of strong infusion, a tea-cup full every two or three hours. By many families in the country this root has long been esteemed as a domestic medicine, resorted to for the relief of pains of the stomach from flatulence and indigestion, hence the vulgar name of *wind root*, by which it is known in some parts of the country, and from its colour it is by some called white root. It is said that by a perseverance for several weeks in the use of about one drachm of the powdered root every day, the lost tone of the stomach and digestive powers has been restored.

This plant is well deserving a place in every garden, its ornamental appearance, and medicinal utility, will richly compensate the cultivator. I have this season had the satisfaction of examining a plant of twenty-nine stalks, more than two feet high, spreading like a potatoe hill. the branches handsomely crowned with elegant orange coloured flowers, and constantly visited by large brilliant butterflies.

Other species of swallow-wort, it is highly probable, as suggested by Professor Barton, will be found on trial to possess medicinal virtues, and they ought to arrest the attention of physicians in the country, until they become familiarized to the specific character, and properties of this valuable class of American plants.

Dr. Cutler describes another species, *asclepias syriaca*, or common silkweed, often called also milkweed, from its abundance of milky juice. The leaves are spear or tongue shaped, larger than the preceding, and in August its aggregate, reddish, or purple blossoms, are exhibited at the extremities of the branches, and axillæ of the leaves. The seeds are contained in large oblong pods, and are crowded with down extremely fine and soft, resembling silk, which has occasioned the name of silk weed. This substance has been mixed with cotton and spun into candle wicks. The stalk of this species is from three to six feet high, the leaves large, standing on short foot stalks. A milky juice exudes from the stems or leaves when broken. The root, as soon as it penetrates the earth, shoots off horizontally, and often sends out other stalks. The large roots are cortical and ligneous. It abounds near fences on the road side in all parts of the country.

Dr. Abijah Richardson of Medway, Massachusetts, has been induced to try the effects of this species. He gave the cortical part of the root in powder, one drachm in a

day, in divided doses, and also in strong infusion. An asthmatic patient was much benefited by its use. In one case of typhus fever with catarrhal affection of the throat and bronchiæ, it rendered the expectoration more copious, and the matter thicker and more digested. In both cases it had an anodyne effect, the patients were relieved from pain, from dyspnœa and cough, and expectoration became easier and sleep more refreshing.

ASTRAGALUS TRAGACANTHA. *Goatshorn.* The gum called gum tragacanth.

Gum tragacanth is the product of a very thorny shrub, which grows on the island of Candia and some other places in the Levant. It is obtained by oxidation; it comes in small rinkled pieces, semi-transparent and brittle, has neither taste nor smell, and is entirely a pure gum. It is greatly superior to all the gums in giving vicidity to water. Its solution is not perfectly uniform, unless boiled for some time. Tragacanth has virtues similar to gum arabic, and is principally employed as a demulcent to blunt acrimonies, and as a pharmaceutic agent.

ATROPA BELLADONNA. *Deadly night-shade.* The leaves.

The deadly night-shade, is a perennial branching plant, two or three feet high, growing spontaneously in gloomy lanes and uncultivated places. The leaves are ovate, entire. The flowers come out among the leaves singly, on long peduncles, in June and July. The corolla is of a dusky brown colour, on the out side, and of a dull purple within; the stalks have a tinge of the same colour, as have also the leaves towards autumn. The berry is round, green, changing to red, and when ripe of a shining black, and not unlike a black cherry in size and colour. It contains a purple juice of a mawkish sweetness, which stains paper of a beautiful and durable purple. The whole of this plant is a strong poison of the narcotic kind: and children have frequently been enticed to eat the berries at their peril. The symptoms excited, are a dryness of the mouth; a trembling of the tongue; a very distressing thirst; difficulty of swallowing; fruitless endeavours to vomit; and great anxiety about the præcordia. Delirium then comes on with gnashing of the teeth and

convulsion. The pupil remains dilated, and is not sensible, even to the stimulus of light. The face becomes tumid, and of a dark red colour. The jaws are frequently locked; inflammation attacks the stomach and intestines; mortification and death succeed. The body soon putrifies, swells, and becomes marked with livid spots; and the stench is insupportable. The best method of cure is, to excite vomiting as soon as possible, to evacuate the bowels by purgatives and clysters, and to give largely, vinegar, honey, milk, and oil. Yet this virulent poison, under proper management, may become an excellent remedy. Besides a very remarkable narcotic power, it possesses considerable influence in promoting all the excretions, particularly by sweat, urine, and it is said by saliva; but its exhibition requires the greatest caution; and when dangerous symptoms occur, its use must be suspended for some time, and afterwards resumed in smaller doses.

Deadly night-shade has been exhibited in several febrile diseases, in obstinate intermittents, in inflammations and gout; in comatose diseases, palsy, and apoplexy; in spasmodic diseases; in chorea, epilepsy, melancholy and mania; in cachectic affections, in dropsies and obstinate jaundice; in local diseases; in amaurosis; in schirrus and cancer. Belladonna is supposed by some German authors, to possess properties adapted to the prevention and cure of hydrophobia in doses from two to six grains; and it is said to have proved useful in tic douloureux.

Belladonna is best exhibited in substance, beginning with a very small dose of the powdered leaves, or root; such as the fourth or eighth of a grain for children, and one grain for adults; to be repeated daily, and gradually increased. The watery infusion is also a powerful remedy; one scruple of the dried leaves are infused in ten ounces of warm water, and strained after cooling. At first two ounces of this may be given daily to adults, and gradually increased, until the tension of the throat shews that it would be dangerous to go farther. In this manner Dr. Cullen has repeatedly experienced its efficacy in cancerous affections. Externally the powdered leaves are applied as a narcotic to diminish pain in cancerous and other ill conditioned sores.

Several species of this class of plants are found growing spontaneously among us. One of these has a ligneous stalk which with the leaves are armed with sharp prickles. The corolla is white, the anthers yellow.

The *garden night shade* has a branched herbaceous stalk, unarmed, and is annual. It is a common weed on dunghills, in gardens and other richly cultivated places. The fruit stalks are lateral, hanging midway between the leaves. The flowers grow on a sort of nodding umbel; the corolla is white from July to October, and the berries, when ripe, are of a shining black, and about the size of black cherries. Dr. Withering says, from one to three grains of the leaves of garden night shade infused in boiling water, and taken at bed time, occasions a copious perspiration; increases the secretion by the kidneys, and generally purges more or less the following day. These properties, judiciously applied, render it capable of doing essential service in several diseases. But its effects on the nervous system are so uncertain, and sometimes so considerable, that it must ever be administered with the greatest caution. The leaves externally applied abate inflammation, and assuage pain. And in inflammations and swellings, bruises, &c. in horses, the application of these leaves has proved of great utility.

Aurum. *Gold.*

This metal was formerly supposed to possess medicinal properties, but its preparations have been expunged from modern pharmacopœias as being considered unfriendly to the human constitution, or devoid of efficacy as a remedy in disease.

In a publication printed at Paris in 1811 by Dr. J. A. Chrestien of Montpellier, the medical faculty are again invited to investigate the properties of gold. The author proposes a preparation of this metal as a new remedy for the treatment of venereal and lymphatic disorders. His numerous experiments on the anti-syphilitic powers of the preparations of gold, have greatly elated his hopes, and rendered him so sanguine as to affirm, that their efficacy is equal if not superior to that of mercury, that they are capable of effecting a radical cure of the varied forms of this disease, without producing salivation, or any derangement of the functions of the body, and that no season, no temperament, and no complication of the disease can create any obstacle to their efficacy.

Of the above assertions we are not left destitute of corroborative evidence.

Doctors Seaman and Pascalis of New-York have experienced the anti-syphilitic virtues of the preparations of this metal, and their observations, so far as they have extended, are in confirmation of the opinion of Dr. Chrestien.

Gold may be employed, for this purpose, in the state—1. Of minute division. 2. Of oxide. 3. Of oxide in combination with ammonia. 4. Of oxide in combination with oxide of tin. 5. Of muriate.

The first of these, denominated by the author, "*Or devise*," was prepared by forming an amalgam of gold and quicksilver, and afterwards withdrawing the latter by exposing the compound to the rays of the sun concentrated by a convex lens, to the heat of a fire, or to the action of nitric acid. The gold remained in the form of an impalpable powder.

The yellow oxide of gold was obtained by precipitating it from its solution in nitro-muriatic acid by potash. The manner of effecting this he has not mentioned, and, as it will be seen below, there are some difficulties in the way of preparing it of an uniform strength. The oxide precipitated from its solution by ammonia was soon laid aside from the danger of its spontaneous explosion.

The compound oxide of gold and tin, may be obtained by mixing the solutions of these metals, or by adding metallic tin in filings to a diluted solution of gold. He prefers the latter.

The muriate of gold, says Dr. Chrestien, procured by evaporating the solution to dryness, was so deliquescent, and caustic, that I made but little use of it; but supposing a muriate with two bases might obviate these inconveniences, I combined the muriate of soda with the solution of gold, and obtained the desired product.

Numerous detailed cases are given in the subsequent part of his work on the effects of each of these preparations, in syphilis. They differ much from each other in activity, the oxides producing more speedy effects than the powdered gold, and the muriate more powerful action than the oxides. They were all administered by friction on the tongue, cheeks, or gums. The *or devise* was thus prescribed to the extent of three grains in a day; the oxide precipitated by potash in a dose of half a grain gradually augmented to two grains; the compound oxide of tin and gold in rather smaller doses; and lastly, the muriate of gold in the quantity of from one-fifteenth to

one-tenth of a grain. On account of the superior activity of the latter, he found it necessary to mix it with certain substances which were capable of diminishing its energy, without abstracting its oxygen. He employed for this purpose *starch, charcoal,* and *painters lac.*

From the variety of cases brought forward by the author, to prove the activity, and the anti-syphilitic virtues of gold, we collect that within a moderate time it cures chancres, warts, secondary ulcers, sore throats, and other forms of inveterate lues. This favourite remedy of Dr. Chrestien is said also to have effected important cures in cases of diseases of the uterus, of goitre, and other lymphatic diseases or obstructions; in all similar affections, therefore, it is undoubtedly deserving of trial.

It seems proper here to direct to the best mode of obtaining the preparations of this metal of an uniform strength.

Gold, in a state of minute division, may be procured with facility, by pouring into a diluted solution of this metal a solution of green sulphate of iron; a brown or bluish brown powder will be precipitated, which is metallic gold minutely divided. The best proportions of the acids to dissolve this metal, according to Vauquelinare, two parts of muriatic to one of nitric acid. Potash and soda, and their carbonates, do not decompose the solution at common temperatures; they merely give it a deep red colour with a little turbidness. The red substance when dried has the appearance of dried blood. It has a styptic metallic taste, and is slightly soluble in water. It is inferred to be a compound of oxide of gold with a minute portion of muriate of gold.

To precipitate the greatest quantity of oxide from its solution, by means of the alkalis, we must manage so that no useless acid shall remain in the solution, in order that less of the triple salt may be formed; this is effected by evaporation to dryness, very cautiously conducted, the product being again dissolved in distilled water.

The compound oxide of gold and tin, or the purple powder of Cassius, may be formed either by adding the solutions of tin and gold much diluted to each other, or by immersing metallic tin in a diluted solution of gold. It is so difficult properly to prepare the solution of tin, so as always to produce the same colour and the same relative proportions in the component parts of the precipitate,

that the latter method is preferable; the neutral solution of gold being diluted with one hundred parts of distilled water, and metallic tin being added to it. The formation and preservation of the muriate of gold is a work of some difficulty. The evaporation of the solution must be very carefully conducted; for the affinity between this metal and oxygen is so slight, that a moderate degree of heat is sufficient to overcome it. When therefore the temperature is high, the muriate will be decomposed, part of the gold will appear in the form of purple oxide, and part in its metallic state. When properly prepared, it has a strong attraction for moisture, it soon deliquesces, and becomes soft and even liquid.

The preparations of this metal were administered by Dr. Chrestien, by friction; but if we reason from analogy, more positive effects might be supposed to follow from its being taken internally. No difficulty would be experienced in preparing the oxide for this purpose; and the muriate might, with equal facility, be exhibited either by forming a triple muriate in the liquid form, or by dissolving the muriate of gold in a given portion of distilled water.—*Med. Repos. Hex. 3. vol. 3. N. Eng. Med. Journal, No. 3.*

We wait the issue of more extensive experience and observation to decide whether gold is entitled to all, or any part of the merit ascribed to it as a remedy, and is calculated to supersede the mercurial practice so long and so successfully established.

Avena Sativa. *Oats.* The seeds.

When deprived of their husks and formed into groats, oats are converted into an excellent dish for the infirm and diseased. When ground into meal, and boiled in water, they afford a thick and nourishing mucilage, which, with the addition of a few currants, is very wholesome, and produces a mildly laxative effect. An infusion of the husks in water, allowed to remain until it becomes acidulous, is boiled down to a jelly, which is called sowins. In these forms, oats are nutritious and easy of digestion.

Gruels or decoctions, of groats or oatmeal, either plain, acidified, or sweetened, form an excellent drink in febrile diseases, diarrhœa, dysentery, &c. and from their

demulcent properties, prove useful in inflammatory disorders, coughs, hoarseness, roughness, and exulceration of the fauces.

Bismuthum. *Bismuth.*

This metal is of a white colour with a shade of yellow, has a foliated fracture, is brittle, very fusible, capable of being volatilized, and easily susceptible of oxidation. Though it has not been received into the pharmacopœias it has a claim to a place in the materia medica, as its oxide, or rather sub-nitrate, has been employed with considerable advantage in gastrodynia, pyrosis, and other affections connected with debility of the digestive organs. This preparation is obtained by decomposing the solution of bismuth in nitric acid by the affusion of water; the sub-nitrate is precipitated, and is washed and dried. It is given in a dose from two to six grains, two grains being given twice or thrice a day, or in more severe cases, five grains given at once. In these doses it scarcely produces any other sensible effect than a remission of pain, and ultimately, a removal of the morbid state from which this has arisen.

The introduction of this remedy into practice is of recent date, but we are possessed of the most convincing proofs of its having been successfully employed by several eminent practitioners both in Europe and the United States.

Dr. Odier, of Geneva, first introduced this mineral into practice, and Dr. Marcet, physician to Guy's hospital, London, and Dr. Bardsley of the Manchester infirmary, have experienced its medicinal powers; and Drs. Post, Osborn and Stringham of New-York, have added their testimony in favour of its efficacy, as an antispasmodic, particularly in cramps and other painful affections of the stomach.

In an inaugural dissertation by Dr. Samuel W. Moore of New-York, it is the object of the author to present a knowledge of the medicinal powers of the white oxide of bismuth, and to recommend its use in gastrodynia, pyrosis, cardialgia, and other affections of the stomach connected with dyspepsia. He relates several cases of the successful employment of the remedy, and from the most unquestionable authority furnishes decisive evidence of its efficacy in the complaints above mentioned. In those affections

of the stomach whether from intemperance or other cause, which proceed from a want of tone in its muscular fibres, and where there is a disposition in that organ to generate acid, the oxide of bismuth, it is said, effects a permanent cure, when alkalis and absorbent earths afford but temporary relief.

The reviewers of Dr. Moore's dissertation in the New-England Medical Journal, after duly applauding the author, thus express their opinion of the utility of the oxide of bismuth.

"The action of this substance on the stomach is that of a mild and effectual tonic; and from our own experience of its virtues, we do not hesitate to affirm with Odier, Marcet, Bardsley, and Moore, that in pyrosis, cardialgia, and more particularly gastrodynia, it operates more speedily, and with more certainty, than any other article of the materia medica. In the course of the last five years, we have frequently prescribed it in these forms of dyspepsia with almost uniform success; and although a medicine possessing such active properties might be supposed occasionally to produce some unpleasant effects on the system, we have never known any injurious consequences to result from its exhibition. A substance which discovers such qualities ought to be more generally known and more frequently administered; for even on the supposition that it is capable of producing no greater effects than those of the medicines usually prescribed in these complaints, its use will be attended with the advantage of discarding in some measure, from practice the long continued employment of alcohol and bitters, which ultimately lessen the activity of the digestive organs, and either prolong or perpetuate the disease they were intended to relieve."

The oxide of bismuth is prepared, as recommended by Dr. M. according to the following process.

The bismuth to be dissolved should be previously reduced to powder in an iron mortar. Let three parts of nitric acid for one of bismuth be diluted with an equal weight of pure water. To this menstruum, contained in a glass vessel, add the bismuth at intervals, and let it stand till it is all dissolved. Let the clear solution be decanted from the sediment, and a few ounces of it be poured into a glass vessel, capable of containing half as many gallons as there have been measured ounces put in; the vessel is then filled with pure (distilled) water, when

a copious and perfectly white precipitate will be instantaneously formed, giving to the liquid the appearance of milk. After this has subsided, the clear fluid must be decanted, and fresh water thrown on the precipitate to wash it. This operation must be repeated several times, till no acid taste is discoverable in the decanted water. This precipitate, which is pure white oxide of bismuth, should be suffered to dry without heat, or indeed light, for the attraction between oxygen and bismuth is so weak, that if the oxide, while drying, be exposed either to a moderate artificial heat, or the direct rays of the sun, it parts with a portion of its oxygen, and loses its whiteness.

The usual dose in which this substance is prescribed is five or six grains twice or thrice a day, mixed with any convenient vehicle, such as the powder of gum tragacanth, gum Arabic, sugar, or starch, in the proportion of one grain of the oxide to four or five of the powder of either of these substances. It is extremely probable that other medical properties of this valuable article are yet to be ascertained by more extensive research and experiment.

Bitumen Petroleum. *Rock Oil. Barbadoes Tar.*

Bitumen is now employed as a generic name for several inflammable bodies of different degrees of consistency from perfect fluidity to that of a brittle, but very fusible solid, and of little specific gravity.

Petroleum is a bitumen of a red colour, and thick consistence, of a disagreeable smell, and a bitter, acrid taste. In medicinal virtues, it participates of those of oil of amber, and of turpentine. It is, at present, very rarely employed as a medicine; some of the more common mineral oils being preferred. An oil extracted from a kind of stone-coal, has been extolled, under the name of British-oil, for external purposes; against rheumatic pains, paralytic complaints, and for preventing chilblains. Even this is often counterfeited, by adding a small portion of the oil of amber, to the common expressed oils.

The Barbadoes tar is found in several of the West India islands, where it is esteemed by the inhabitants of great service as a sudorific, and in disorders of the breast and lungs; though in cases of this kind, attended with inflammation, it is certainly improper.

BUBON GALBANUM. *Loveaged Leaved Bubon.* The gum resin, called galbanum.

Galbanum is obtained by exudation from incisions, made in the stem of a perennial plant, which grows in Africa. The best kind of galbanum consists of pale coloured pieces, about the size of a hazel nut, which on being broken, appear to be composed of clear white tears, of a bitterish acrid taste, and a strong peculiar smell. Alcohol dissolves its resin, in which its principal virtues reside. Proof spirit dissolves it entirely, the impurities excepted. Triturated with water, it forms a milky-like fluid.

Galbanum possesses the virtues of the fœtid gums, and is used for the same purposes; dose from ten grains to one drachm. It is chiefly employed in the form of plaster to white swellings, and it is supposed to resolve and discuss tumors, and to promote suppuration; but for these purposes, it is more efficacious in a liquid state. In hysteric spasms and inflamed hæmorrhoids, no application can afford more effectual relief, than a tincture from this gum; but in the latter case, the painful parts ought to be covered with linen rags, moistened in lime water, before the tincture is dropped upon them.

CALX. *Lime, recently burnt. Quick-Lime.*

This article is a soft, white, friable substance, prepared from marble, chalk, and other calcareous earths, by the process of calcination. All calcareous earths, whether in the form of marble, lime stone, chalk, marine shells, &c. are convertible into quick lime by the action of heat.

These substances are found in a state of combination with the carbonic acid or fixed air. During the process of calcination, the carbonic acid is expelled from the carbonates, in the state of gas or air; and the product is quick-lime in a caustic state. As quick-lime attracts moisture and carbonic acid from the atmosphere, it should be always recently prepared, or preserved in very close bottles for medicinal use.

Lime is soluble in water in small quantity; the solution has a styptic taste and is the form under which lime has been medicinally employed. It is used with advantage in dyspepsia; its beneficial effects arising principally from

its tonic and astringent quality, as in the small quantity which water can dissolve, it can have little effect by any chemical agency in obviating acidity. It is employed too as an astringent in chronic diarrhœa and in leucorrhœa. As a pure tonic, the product of the combination of it with muriatic acid, the muriate has been introduced into practice as much superior in efficacy to muriate of barytes, and a formula for preparing it is given by the Edinburgh and Dublin colleges. It has been used principally in scrofula and hectic fever, and in dyspepsia. Its dose is from half a drachm to a drachm of its saturated solution; and as it is a medicine of considerable activity, it requires to be given with caution. On the living body, lime acts as an escharotic, and as such is applied to ill-conditioned sores, to soften their callus edges. Farriers are in the practice of applying lime to ulcers and other sores of horses, with much benefit, as a convenient, cheap, and useful escharotic. Lime is much used in pharmacy, for the purpose of forming lime water, and as a chemical agent in several preparations.

CANCER ASTACUS. *The Craw Fish.*
CANCER PAGURUS. *The black clawed Crab.* The claws, called crabs' eyes.

In the head and stomach of the craw fish, are found certain concretions, about the size of peas, or larger, of a white colour, and sometimes of a redish and bluish cast. They are prepared by levigation and washing with water. They are termed *lapilli cancrorum præparati*, formerly *oculi cancrorum præparati*. The tips of the claws of the common crab, are precisely similar in composition, and are prepared in the same manner. They are named *chelæ cancrorum præparatæ*. Both these substances are carbonates of lime, free from the other earths, which chalk always contains, and therefore preferable to it for medicinal use.

CANELLA ALBA. *Canella Alba.* The bark.

This is the inner bark of the branches of a tree which is very common in Jamaica and other West-India islands. It is in quills, or flat pieces, of a light brown or grayish colour; its flavour is aromatic, and its taste pungent. Canella is a moderately strong aromatic, and is employed

principally on account of its flavour. It enters into the composition of several tinctures, and is scarcely applied to any other use.

CAPSICUM ANNUUM. *Cockspur-Pepper.* The fruit.

This species of pepper is a native of South America, and is cultivated extensively in the West-India islands. The pods are long, pointed, and pendulous, at first of a green colour, and afterwards of a bright orange red. The taste of capsicum is extremely pungent and acrimonious; setting the mouth, as it were, on fire. Its pungency is completely extracted by alcohol, and partly by water.

Cayenne pepper is an indiscriminate mixture of the powder of the dried pods of many species of capsicum. These peppers have been chiefly used as a condiment. They prevent flatulence from vegetable food, and have a warm kindly effect upon the stomach. An abuse of them, however, gives rise to visceral obstructions, especially of the liver. Of late they have been employed also in the practice of medicine. There can be little doubt, but they furnish us with one of the purest and strongest stimulants, that can be introduced into the stomach; while, at the same time, they have nothing of the narcotic effects of ardent spirits. Dr. Adair Makitrick, who was perhaps the first that employed them as a medicine, directs them to be given to the extent of six or eight grains, under the form of pills; or in tincture, made by infusing half an ounce of the pods, in a pound of rectified spirit, and to be given from one, to three drachms in a dose. He has found them useful in a variety of affections, particularly in that morbid disposition, which he calls the *cachexia africana*; and which he considers as a most frequent and fatal predisposition to disease among the slaves. Dr. Wright says, that in dropsical and other complaints, where chalybeates are indicated, a minute portion of powdered capsicum, forms an excellent addition, and recommends its use in lethargic affections.

This pepper has also been successfully employed, infused in vinegar, as a gargle in a species of cynanche maligna, which proved very fatal in the West-Indies, resisting the peruvian bark, wine, and the other remedies commonly employed. The practice, though successful

in the West-Indies, it is said, is not without danger from the inflammation it is liable to induce.

In tropical fevers, coma and delirium are common attendants; and in such cases, cataplasms of capsicum have a speedy and happy effect. They redden the parts, but seldom blister, unless kept on too long. In ophthalmia, from relaxation, the diluted juice of capsicum is a sovereign remedy.

Carbo Ligni. *Charcoal of Wood.*

Common charcoal of wood, (carbonous oxide) or carbon of the French chemists, is a sort of artificial coal, consisting of half burnt wood. It is in the form of solid masses of a black colour, is brittle, and has neither smell nor taste. It is extremely porous, and therefore absorbs light strongly, which accounts for its blackness; for, the rays of light, striking on the charcoal, are received and absorbed in its pores, instead of being reflected, whence, the body must of necessity appear black. This substance also attracts air from the atmosphere, which it continues to absorb for a considerable time. It is insoluble in water, and a bad conductor of caloric, but an excellent one of electricity.

This substance is found to consist of 63, 86 of carbon, and 36, 14 of oxygen.

Charcoal possesses a number of singular properties, which render it of considerable importance in many respects. It is incapable of putrifying or rotting, like wood; and so remarkable is the durability of this substance, that it may be preserved to an indefinite length of time; for there yet exists, according to Dodart, charcoal made of corn, (probably in the days of Cæsar,) which is in so complete a state, that the wheat may be distinguished from the rye. Besides the great advantage which this article affords to the artist and manufacturer, it has been of late employed with considerable success—First, in correcting the burnt, or empyreumatic taste in ardent spirits—Secondly, in depriving rancid oil of its disagreeable flavour—Thirdly, in restoring putrid meat. For these useful purposes, it should be previously reduced to powder, and that only used which is fresh prepared, or has been kept in close vessels, that it shall have absorbed no fixed air from the common atmosphere. The tainted flavour of ardent spirits, or the unpleasant one of those

distilled from grain, may be entirely destroyed, by merely shaking it with powdered charcoal.

Charcoal is of still greater utility for purifying water on ship board. The most offensive water may be rendered perfectly sweet, by merely filtrating it through maple, hickory, or oak coal and sand. New made charcoal, by being rolled up in cloths that have contracted a disagreeable odour, effectually destroys it; and the bad taint of meat, beginning to putrify, is in like manner corrected. It is possible that meat surrounded by fresh charcoal, might keep sweet for months. On account of its absorbent and antiseptic properties, this substance promises to be of considerable service in medicine. It has been found to arrest the progress of mortification, when applied in the form of medicated poultice to the affected part, and frequently repeated. In a variety of instances it has been found to have a remarkable effect, in removing habitual costiveness, without inducing an extraordinary degree of weakness, especially if it be mixed with syrup of yellow roses. Many persons, afflicted with that disagreeable complaint, a fœtid breath from a costive habit, have obtained effectual relief by taking two or three times in a day, a table spoonful of each of the above articles. Charcoal, made from maple wood, or burnt bread, finely powdered, makes a simple, efficacious, and safe tooth powder, which is preferable to any other. It neutralizes, and entirely destroys for a time, any fætor which may arise from a carious tooth. It has lately been found to cure *tinea capitis*, by being sprinkled over the ulcer in fine powder.

The most eligible process for preparing charcoal for medicinal uses, free from all impurities and disagreeable taste, is, to inclose small billets of wood in an iron cylinder, having a tube fixed to one end, and distill them until no more smoke and water escape from the tube. Then put out the fire, and close the mouth with clay, until the cylinder cool. The barrels of old guns or pistols, may serve for this purpose; or the pieces of wood may be put into a pot not closely covered, and surrounded with live coals, until all smoke from the pot shall cease. Then remove the coals and closely lute the cover with clay, until the pot cool. Or pulverize some well burnt common charcoal, and then heat it in a covered crucible to a glowing red, till it cease to give out any inflammable vapour. It should be immediately secured in well stopped

glass bottles, and in that way it may be preserved unimpaired for any length of time.

Charcoal is one of the greatest non-conductors of heat. This quality renders it applicable to a variety of economical purposes.

Carbonas. *Carbonate.*

Is a generic name for the combinations of the carbonic acid, with earths, alkalis, and metallic oxyds.

The nature of these substances was totally unknown until the year 1756, when the genius of Dr. Black at once removed the veil, and displayed to his contemporaries a new and immense field, in which the most important discoveries might be made; and to their ardour in cultivating it, we are indebted for the present state of chemical knowledge.

Before the brilliant epoch we have mentioned, the carbonates were supposed to be simple bodies; and the facts of their acquiring new and caustic properties by the action of fire, was attempted to be explained by supposing the particles of fire combined with them. Dr. Black, however, demonstrated by proofs that carried universal conviction along with them, that these bodies in their caustic state are simple, and that their mildness is owing to their being combined with an acid, to which the name of carbonic is now given.

The most general character of the carbonates, is their effervescing violently when any of the stronger acids are poured upon them. This phenomenon is owing to these acids displacing, by their greater affinity, the carbonic acid, which flies off in the form of gas.

The carbonates may be also deprived of the carbonic acid, either by the action of heat alone, or by heating them when mixed with charcoal, which decomposes the carbonic acid, by combining with part of its oxygen, so that both the acid and charcoal are converted into carbonic oxyd gas.

The carbonates may be divided into three great families: the alkaline, the earthy, and the metallic.

Family 1st. The alkaline carbonates have an acrimonious taste; tinge vegetable blues green, and are soluble in water, and insoluble in alcohol.

Family 2d. The earthy carbonates are insipid, and insoluble in water, but soluble in water saturated with carbonic acid.

Family 3d. The metallic carbonates scarcely differ in appearance from the metallic oxyds.

We shall have occasion immediately to notice some individuals of each of these families.

Carbonas Barytes. *Carbonate of Barytes.*

Carbonated baryta is rarely found in nature, and as it was first discovered by Dr. Withering, Mr. Werner gave it the name of Witherite.

Its colour is grayish white, sometimes inclining to milk white, and sometimes with a slight tinge of yellow. It is found in solid masses, sometimes filling an entire vein, sometimes interspersed with sulphated baryta, frequently rounded, or effecting that form, seldom crystalyzed. Although it has no sensible taste, it is poisonous; even in a small dose, it occasions dangerous symptoms. It is used for preparing the muriate of baryta, to which the reader is referred.

Carbonas Calcis. *Carbonate of Lime. Chalk.*

1. *Soft Carbonate of Lime, called Chalk.*
2. *Indurated Carbonate of Lime, called Marble.*

Of the two varieties of this article, the soft carbonate of lime, *Creta alba*, white chalk, is principally employed in medicine. This is a carbonate of lime found abundantly in nature; it always contains more or less argillaceous, and siliceous earths. From the grosser impurities with which it is mixed, it is freed by levigation and washing. It is then termed prepared chalk, and is very commonly employed as an antacid. As the salt it forms with the acid in the stomach, has no purgative quality, it is the one commonly employed to check diarrhœa, proceeding from acidity. It is given in a dose of one or two drachms, with the addition of a small quantity of any aromatic. In pharmacy, it is employed for the preparation of carbonic acid gas, and of the muriate of lime. Powdered chalk has been externally applied with success to scalds and burns.

Carbonas Potassæ Impurus. *Impure Carbonate of Potass, called Pearl Ashes.*

The potashes of commerce are made by reducing large quantities of wood of any kind to ashes; this process is termed incineration. The ashes, which are of a blackish gray, or white colour, are next boiled in water, so as to form a strong lixivium or ley; which, after being strained, is evaporated in an iron vessel almost to dryness. The saline matter which remains at the bottom, is then put into a crucible, and liquified over an intense heat, and poured out on iron plates, where it speedily cools, and assumes the form of concrete salt. This, however, being mixed with many impurities, is again burnt in a reverbatory furnace, and in this state, although not free from impurities, it receives the name of *pearl ashes*. This is the fixed vegetable alkali, and was formerly known in Pharmacopœias under the names of Sal Absinthii, Sal Tartari, &c. and by the London College, Kali. But, since the fixed vegetable alkali, from whatever vegetable it has been produced, is one and the same thing; those several terms as leading to error, have been with justice expunged, and the new chemical term *potassa*, universally adopted.

The best vegetable alkali is obtained from weeds, the ashes of which yield a larger proportion of salt, than most kinds of wood; and among these, wormwood is said to produce the largest quantity. This kind of salt never preexists in the vegetable, but is always generated during the burning. These salts are acrid and caustic. They may be purified sufficiently, for pharmaceutical uses, by lixiviating them in cold water, and evaporating the ley to dryness in an iron pot.

Potassa is of extensive use in medicine, and particularly serviceable in complaints of the stomach and intestines, produced by acids. The medicinal virtues of this salt are, to attenuate the juices, resolve obstructions, and promote the natural secretions. A diluted solution of it, drank warm in bed, generally excites sweat; if that evacuation is not favoured, its sensible operation is by urine. When acidities abound in the first passages, this salt absorbs the acid, and unites with it, into a mild, aperient, neutral salt. As one of its principal effects is to render the animal fluids more thin; it is obvious, that where they

are already colliquated as in scurvies, and in all putrid disorders, in general this medicine is improper.*

The common dose of this salt is from two or three grains to a scruple, or even to a drachm. Its acrimony must, however, be sheathed with some mucilage, or largely diluted with watery liquors.

But potassa is more frequently employed in a neutralized state with the vegetable acids. It is of late employed in calculous complaints, but its continued use seldom fails to injure the constitution, or the intestinal canal.

* According to the theory of Dr. Mitchell, and other respectable writers in the United States, alkaline salts, both fixed and volatile, but more especially potash and soda, are the greatest detergents, or purifiers, which are known. They are capable of resisting the dangerous progress of the septic acid, abounding in pestilential or infectious air. Hence they are employed as the principal and active ingredient in soaps, and are signally active in the form of lixivia, or leys, in cleansing and purifying apartments in houses and ships, when infected with putrid exhalations. Alkalis, too, are the most powerful antiseptics with which we are acquainted. Potash and soda are remarkable for removing tainted and fœtid odours, and for keeping animal substances sweet, entire, and free from decay. They cleanse garments, and every thing else which is contaminated with common filth, infection, and contagion, which they neutralize, and render harmless. Alkalis are admirable remedies in fevers, and in dysentery. Administered by the mouth, they neutralize in their passage through the alimentary canal, the septic acid, which is the existing cause, and, injected in clysters, they allay tenesmus like a charm.

In both cases they mitigate pain, allay spasmodic action, and restore and equalize the peristaltic motion. They effectually destroy the fœtor and infection of the stools.

Alkalis are also excellent helps in surgery; many foul ulcers are very much benefited by their application with the dressings, in weak, watery solution. Experiments have proved, that in foul and degenerate ulcers, of the common, as well as of the syphilitic, cancerous, and scrofulous kinds, the matter secreted on their surfaces, degenerates to a venemous acid; the propriety of alkaline dressings, therefore, will be instantly apparent.

These and other properties of alkalis, have been treated of in Dr. Mitchell's Essays, published in the several volumes of the Medical Repository of New-York; where the reader will find a large body of evidence in favour of the antiputrifactive and antipestilential properties of alkalis, and of their virtues in curing various diseases.

It is applied externally as a stimulant to the inactive state of the vessels, in certain foul ulcers.

Dr. Mitchell recommends the use of potash cakes for children, to prevent the injurious effects of acidity in their stomachs, and mitigate the disorders to which their bowels are liable. He observes, that those children who have been accustomed to eat cakes, a little tinctured with this excellent ingredient, grow fat and healthy.

CARBONAS SODÆ IMPURUS. *Impure Carbonate of Soda.*

The fixed mineral, or fossil alkali, called soda, is a very common mineral production. It is the basis of sea salt, and is found on the surface of the earth in Egypt, Syria, Barbary, &c. but the native production being found greatly inadequate to the consumption of this article, in the arts and manufactures; it is now obtained by the incineration of marine plants, especially the Spanish Barilla, Kali, &c. These plants, after being dried, are thrown into a deep pit, where they are burnt. When the incineration is complete, the soda is found at the bottom, caked into a solid mass. When good, it is firm, heavy, dry, sonorous, spongy, and internally of a blue colour, mixed with white spots; does not deliquesce, emits no unpleasant smell on solution, and does not leave a large proportion of insoluble matter. In medicine, this salt possesses similar virtues with the carbonate of potash, and from its crystalizability and efflorescence when exposed to the air, it is preferable to it, because its dose may be more accurately ascertained, and may be given, either in the form of powder or pills. A solution of soda is an excellent gargle for cleansing the throat, mouth, and gums, both in a sound and a diseased state; while it whitens the teeth, and dissolves all incrustations that may have been formed on their surfaces, without injuring their enamel. A small quantity of this liquid occasionally swallowed, after washing the fauces, is said effectually to remove a fœtid breath. Soda is also in many instances preferable to magnesia, for correcting acidity in the stomach. It also acts as a tonic, and in many instances gives great relief in calculous complaints, although there can be little reliance placed upon it as a lithontriptic.

Carbonas Zinci Impurus. *Impure Carbonate of Zinc.*

This mineral is found plentifully in England, Germany, and other countries, either in distinct mines, or intermingled with the ores of different metals. It is usually of a grayish, brownish, yellowish, or pale reddish colour. This mineral, formerly called *Lapis Calaminaris*, is generally roasted, before it comes into the shops, to render it more easily reducible into a fine powder. In this state it is employed in collyria, against defluctions of thin acrid humours upon the eyes, and is the basis of the common healing cerate.

Carum Carui. *Caraway.* The seeds.

This is an indigenous, biennial plant, cultivated in our gardens, both for medicinal and culinary uses. On account of their aromatic smell, and warm pungent taste, the seeds of caraway may be classed among the finest stomachics and carminatives of our climate. To persons afflicted with flatulency, and liable to colics, if administered in proper quantities, they generally afford considerable relief, and may sometimes be used with advantage in tertian agues.

Cassia Fistula. *Cassia Tree.* The fruit.

This tree is indigenous in India and Egypt, and is cultivated in Jamaica. Its fruit is a cylindrical pod, scarcely an inch in diameter, a foot or more in length; the outside is a hard, brown bark; the inside is divided by thin, transverse, woody plates, covered with a soft black pulp, of a sweetish taste, with some degree of acrimony. This pulp, which dissolves, for the most part, both in water and rectified spirit, is a gentle laxative, and is frequently given in doses of several drachms, to persons of costive habits. In inflammatory complaints, it is sometimes administered in much larger doses, from one to two ounces, when acrid purgations are improper; though it is apt to nauseate the stomach, to produce flatulency, and griping; especially if the pulp be of an inferior kind, or spoiled by long keeping: these effects may, however, be obviated by the addition of aromatics, and by taking it in a liquid form.

There are several species of cassia in the United States. Cassia Marilandica is used in the southern states, as a purgative, and possesses nearly the same virtues as the senna of the shops.

CASSIA SENNA. *Senna.* The leaves.

This species of cassia is annual, although in its mode of growth, it resembles a shrub, and sends out hollow, woody stems, to the height of four feet. It is principally brought to us from Alexandria, in Egypt. The leaves, the only part in use, are of an oblong figure, sharp pointed at the ends, about a quarter of an inch broad, and not a full inch in length, of a lively yellowish green colour, a faint, not very disagreeable smell, and a subacrid bitterish, nauseous taste. Some inferior sorts of this drug are obtained from Tripoli, and other places; but they may be easily distinguished, as the latter is of a fresh green colour, without any yellow shade.

Senna is a useful purgative, operating mildly, though effectually; and at the same time promoting the secretion of urine. It is always given in the form of watery infusion, two or three drachms being infused in four or six ounces of water, with the addition of a few coriander seeds, to cover its flavour, and obviate griping. It is also frequently combined with manna, with tamarinds, or with acidulous tartrite of potash, to increase its action on the bowels. By decoction with water, the activity of senna is much impaired, if not destroyed.

CASSIA MARILANDICA. *American Senna.* The leaves.

This plant is abundant in America, and known by the name of senna, is of the same genus with the senna of the shops, and possesses nearly the same virtues as the eastern species. It is used as a purgative, in different parts of the United States, and, from the high price of foreign senna, deserves to be attended to. It is easily cultivated from the seeds, and ought to be generally introduced into our gardens.

CASTOR FIBER. *The Beaver.* The substance collected in the follicles, near the anus, called castor.

The beaver is an amphibious animal, which inhabits the northern parts of Europe, Asia, and America; in the

banks of rivers, or lakes, and at a distance from the habitations of men. Near the rectum of both sexes, there are two little bags, about the size of a hen's egg, containing a brownish oily matter, called *castor*, which is a peculiar deposition of fat, interwoven with cellular membrane. This substance has a disagreeable, narcotic smell, and a bitterish, acrid, nauseous taste. By drying it in the smoke of a chimney, it may be preserved seven or eight years. The best castor is brought from Russia, Prussia, and Poland; that procured in Canada, and New England, is of an inferior quality. That which is very old, quite black, and destitute of smell and taste, is unfit for medicinal use.

To preserve this drug from injury, it should be kept wrapt up in bladders or oiled-paper. Its active matter is dissolved by alcohol, proof spirit, and partially by water. The tincture made with diluted alcohol, is the least nauseous. Castor is an excellent antispasmodic, and acts particularly upon the uterine system. It is given with advantage in most spasmodic diseases, especially in hysteria and epilepsy. In powder, which is the most eligible form, it is exhibited in doses from ten to twenty grains, or from one to two drachms of the tincture.

CENTAUREA BENEDICTA. *Blessed Thistle.* The herb.

The carduus benedictus is an annual exotic plant, cultivated in gardens; it flowers in June and July, and produces ripe seeds in autumn.

The virtues of this plant, says Dr. Duncan, seem to be little known in the present practice. The nauseous decoction is sometimes used to provoke vomiting, and, a strong infusion, to promote the operation of other emetics. But excellent effects have been frequently experienced, from a slight infusion of carduus, in loss of appetite, where the stomach has been injured by irregularities. A stronger infusion, made in cold or warm water, if drunk freely, and the patient kept warm, occasions a plentiful sweat, and promotes the secretions in general.

CERA. *Wax.*

a. Flava. *Yellow.*

b. Alba. *White.*

For this useful substance, we are indebted to the common honey bee, by whom it is collected from the leaves

and flowers of vegetables. It is formed into solid cakes by melting the combs, after all the honey has been expressed from them, in hot water. The best sort should be hard, compact, of a clear yellow colour, and an agreeable odour, similar to that of honey. Pure bees-wax, when recent, is tough, yet easily broken; by long keeping, it becomes harder, and more brittle, loses its fine colour, and, in some measure, its fragrance.

The yellow colour of bees-wax, and its peculiar smell, may be destroyed by the combined action of water, air, and the sun's rays. In the process for bleaching wax, we therefore extend its surface as much as possible, by melting it, and forming it into thin plates which are exposed to the sun's rays, and repeatedly moistened until they acquire the whiteness desired. White wax is more delicate, but in medicine, it has no advantage over yellow wax. When taken internally, wax agrees in its effects with the fat oils, and is preferable, in being less apt to become rancid. Its principal use, is for the formation of cerates, ointments, and plasters.

CERVUS ELAPHUS. *The Stag, or Hart.* The horns.

The horns of the common male, red deer, have long been considered as an article of Materia Medica. The scrapings, or raspings of these horns, are medicinal, and employed in decoctions, ptisans, or cooling drinks, &c. Hartshorn jelly is remarkably nourishing, and sometimes given as an agreeable demulcent, in cases of diarrhœa. The coal of hartshorn, which is prepared by exposing it to a strong and long continued fire, changes into a very white earth, called *calcined hartshorn.* It is employed as an absorbent, and likewise in dysenteries, which are supposed to arise from acrid and ill digested matter. These animal horns are to be considered of the same nature as bones; and their products by heat, are those of animal substances in general. They were formerly so much employed for the preparation of the volatile alkali (ammonia) that it was commonly called hartshorn.

CHENOPODIUM ANTHELMINTICUM. *Jerusalem Oak.* The herb and seeds.

This plant, a native of Buenos Ayres, and of various parts of the United States, is said to be an excellent ver-

mifuge. The whole plant has a powerful smell, of which it is very retentive; the taste is bitter, with a good deal of aromatic acrimony. The whole plant may be employed. Sometimes the expressed juice is used in the dose of a table spoonful, for a child of two or three years old: more commonly, however, the seeds, emphatically called *wormseed*, are reduced to a fine powder, and made into an electuary with syrup. Of this, the dose for a child two or three years old, is a table spoonful early in the morning. The patient is to be kept without nourishment for some hours; after supper another dose is to be administered. It is often necessary to continue this course for several days, and great numbers of lumbrici are frequently discharged, after the use of a few doses of the medicine.

CHIRONIA CENTAURIUM. *Smaller Centaury.* The flowering heads.

This plant is annual, and grows wild in many parts of England, and other countries, chiefly on barren pastures. It agrees in every respect with other pure bitters. The chironia angularis, common American centaury, is a native of the United States, and has the appearance of lesser centaury (gentiana centaurium). It is universally known by the name of centaury, and is deservedly esteemed as an highly medicinal, and very agreeable simple bitter.

It is used with great success in relaxations of the stomach, loss of appetite, and general debility. In sickly situations, an infusion of this plant, joined with calamus aromaticus, is commonly resorted to as an excellent medicine, taken in the morning as a preventive.

CINCHONA OFFICINALIS. *Officinal Cinchona. Peruvian Bark.* The bark.

a. Communis. *The Common.*

b. Flava. *The Yellow.*

c. Rubra. *The Red.*

It is by no means ascertained, that the two last are the bark of the cinchona officinalis, but have been merely classed under it until we are better acquainted with their botanical history.

The tree affording this bark grows wild in the hilly parts of Peru. In the dry season, from September to November, the bark is stripped from the branches, trunk, and root, and after being carefully dried in the sun, is packed in skins. The name Cinchona, is derived from that of the lady of the Spanish viceroy, who was cured by the bark, in the year 1640. The discovery of its medicinal virtues was in all probability an accident, and on its first introduction into Europe, it was reprobated by many eminent physicians; and at different periods long after, it was considered a dangerous remedy; but its character, in process of time, became universally established.

The common pale bark is in the form of small quilted twigs, thin, breaking close and smooth, friable between the teeth, covered with a rough coat of a brownish colour, internally smooth and of a light brown; its taste is bitter, and slightly astringent; flavour lightly aromatic, with some degree of mustiness.

The yellow Peruvian bark has only been introduced since the year 1790. It approaches more to the yellow colour, than either of the others do; is in flat pieces, not convoluted like the pale; nor dark coloured, like the red; externally smooth, internally of a light cinnamon colour; friable, and fibrous; has no peculiar odour different from the others; but a taste incomparably more bitter, with some degree of astringency.

The red Peruvian bark is in large thick pieces, externally covered with a brown rugged coat, internally more smooth and compact, but fibrous; of a dark red colour, taste and smell similar to that of the pale, but the taste rather stronger. Its powder is reddish, like that of Armenian bole; its astringency and bitterness are more intense, and it contains more resin than the pale bark. It also produces its effects in smaller doses; but it is said to be more frequently adulterated.

Practitioners have differed much with regard to the mode of operation of the Peruvian bark. Some have ascribed its virtues entirely to a stimulant power. But while the strongest and most permanent stimuli have by no means the same effect with bark in the cure of diseases, the bark itself shows hardly any stimulant power, either from its action on the stomach, or on other sensible parts to which it is applied. From its action on the dead animal fibre, there can be no doubt of its being a power-

ful astringent; and from its good effects in certain cases of disease, there is reason to presume that it is a still more powerful tonic. To this tonic power some think that its action, as an antiseptic, is to be entirely attributed; but that, independently of this, it has a very powerful effect in resisting the septic progress to which animal substances are naturally subjected, appears beyond all dispute, from its effects in resisting putrefaction, not only in dead animal solids, but even in animal fluids, when entirely detached from the living body.

But although it be admitted that the Peruvian bark acts powerfully as an astringent, as a tonic, and as an antiseptic, yet these principles will by no means explain all the effects derived from it in the cure of diseases. And accordingly from no artificial combination in which these powers are combined, or in which they exist even to a higher degree, can the good consequences resulting from Peruvian bark be obtained. Many practitioners, therefore, are disposed to view it as a specific. If, by a specific, we mean an infallible remedy, it cannot indeed be considered as entitled to that appellation; but as far as it is a very powerful remedy, of the operation of which no satisfactory explanation has yet been given, it may with great propriety be denominated a specific. But, whatever its mode of operation may be, there can be no doubt that it is daily employed with success in a great variety of diseases.

It was first introduced for the cure of intermittent fevers; and in these, when properly exhibited, it rarely fails of success. Practitioners, however, have differed with regard to the best mode of exhibition; some prefer giving it just before the fit, some during the fit, others immediately after it. Some, again, order it in the quantity of an ounce, between the fits; the dose being the more frequent and larger according to the frequency of the fits; and this mode of exhibition, although it may perhaps sometimes lead to the employment of more bark than is necessary, we consider as upon the whole preferable, from being best suited to most stomachs. The requisite quantity is very different in different cases; and in many vernal intermittents it seems even hardly necessary.

It is now given from the very commencement of the disease, without previous evacuations; which, with the delay of the bark, or under doses of it, by retarding the

cure, often seem to induce abdominal inflammation, scirrhus, jaundice, hectic, dropsy, &c. symptoms formerly imputed to the premature or intemperate use of the bark, but which are best obviated by its early and liberal use. It is to be continued not only till the paroxysms cease, but till the natural appetite, strength, and complexion return. Its use is then gradually to be left off, and repeated at proper intervals to secure against a relapse; to which, however unaccountable, there often seems to be a peculiar disposition; and especially when the wind blows from the east. Although, however, most evacuants conjoined with the Peruvian bark in intermittents are rather prejudicial than otherwise, yet it is of advantage, previous to its use, to empty the alimentary canal, particularly the stomach; and on this account, good effects are often obtained from premising an emetic.

It is a medicine which seems not only suited to both formed and latent intermittents, but to that state of fibre, on which all rigidly periodical diseases seem to depend; as periodical pain, inflammation, hæmorrhagy, spasm, cough, loss of external sense, &c.

Bark is now used by some in all continued fevers; at the same time attention is paid to keep the bowels clean, and to promote, when necessary, the evacuation of redundant bile; always, however, so as to weaken the patient as little as possible.

In confluent small pox, it promotes languid eruption and suppuration, diminishes the fever through its whole course, and prevents or corrects putrescence and gangrene.

In gangrenous sore throats, it is much used, as it is externally and internally in every species of gangrene.

In contagious dysentery, after due evacuation, it has been used, taken internally and by injection, with and without opium.

In all those hæmorrhagies called passive, and which it is allowed all hæmorrhagies are very apt to become, and likewise in other increased discharges, it is much used; and in certain undefined cases of hæmoptysis, some allege that it is remarkably effectual when joined with an absorbent.

It is used for obviating the disposition to nervous and convulsive diseases; and some have great confidence in it, joined with sulphuric acid, in cases of phthisis, scrofula,

ill conditioned ulcers, rickets, scurvy, and in states of convalescence.

In these cases, notwithstanding the use of the acid, it is proper to conjoin it with a milk diet.

In dropsy, not depending on any particular local affection, it is often alternated or conjoined with diuretics or other evacuants; and by its early exhibition after the water is once drawn off, or even begins to be freely discharged, a fresh accumulation is prevented, and a radical cure obtained.

Mr. Pearson, of the Lock Hospital, praises very highly the powers of this remedy in different forms of the venereal disease; in reducing incipient bubo, in cleansing and healing ulcers of the tonsils, and in curing gangrenous ulcers from a venereal cause. But in all these cases mercury must also be given to eradicate the venereal virus from the system.

Peruvian bark may be exhibited,

1. In substance.

The best form of exhibiting this valuable remedy is in the state of a very fine powder, in doses of from ten grains to two drachms and upwards. As it cannot be swallowed in the form of a dry powder, it must either be diffused in some liquid, as water, wine, or milk; or mixed with some viscid substance, as currant jelly. Its taste, which is disagreeable to some people, is best avoided by taking it immediately after it is mixed up; for by standing any time, it is communicated to the vehicle. In this respect, therefore, it is better for the patients to mix it up themselves than to receive it from the apothecary already made up into a draught with some simple distilled water, or into an electuary with a syrup. A much more important objection to this form of giving Peruvian bark is, that some stomachs will not bear it, from the oppression and even vomiting which in these cases it excites. We must endeavour to obviate this inconvenience by the addition of some aromatic, and by giving it in small doses more frequently repeated. If we are unable to succeed by these means, we must extract the most active constituents of the bark by means of some menstruum. It has therefore long been a pharmaceutical problem, what menstruum extracts the virtues of Peruvian bark the best. But the active constituents of this remedy, according to the best and latest analysis, are bitter extractive, tannin, and gallic acid, combined with some mucilage and resin. Of

these, the two last are not soluble in any one menstruum; but they most probably contribute very little to the powers of the medicine. The three other constituents, on the contrary, on which all its activity depends, taken singly, are all of them very soluble both in water and in alcohol, and in every mixture of these. But it would be contrary to analogy to suppose, that these substances should exist so intimately mixed as they must be in an organic body, without exerting upon each other some degree of chemical affinity, and forming combinations possessed of new properties. Accordingly we find, whether it arise from this cause, or merely from the state of aggregation, that neither water nor alcohol extracts these constituents from Peruvian bark in the same quantity in which they are able to dissolve them separately, and that we must have recourse to direct experiment to determine the degree of action possessed by each menstruum upon it. With this view many experiments have been made, and by very able chemists. But most of them were performed when the science of chemistry was but in its infancy; and even at this time that branch of it which relates to these substances is so little understood, that the results of the late experiments are far from conclusive.

2. *In infusion.*

To those whose stomachs will not bear the powder, this is the best form of exhibiting Peruvian bark. Water, at a given temperature, seems capable of dissolving only a certain quantity, and, therefore, we are not able to increase the strength of an infusion, either by employing a larger quantity of the bark, or allowing it to remain longer in contact. One part of bark is sufficient to saturate sixteen of water in the course of an hour or two. To accelerate the action of the water, it is usual to pour it boiling hot upon the bark, to cover it up, and allow it to cool slowly. After standing a sufficient length of time, the infusion is decanted off for use. The infusion in water is however liable to one very great objection, that it cannot be kept even a very short time without being decomposed and spoiled. Therefore, in some instances, we prepare the infusion with wine; and it fortunately happens that very often the use of the menstruum is as much indicated as that of the solvent.

3. *In tincture.*

The great activity of the menstruum in this preparation, prevents the bark from being given in sufficiently large

doses to exert its peculiar virtues. It is, however, a powerful stimulant.

4. In decoction.

Water of the temperature of 212° is capable of dissolving a much larger proportion of the soluble parts of Peruvian bark than water at 60°. But the solvent powers even of boiling water have their limits, and by protracting the decoction we do not increase its strength, but rather, by diminishing the quantity of the menstruum, we lessen the quantity of the matter dissolved. Besides, at a boiling temperature, extractive absorbs oxygen rapidly from the atmosphere, and is converted into what seems to be an insoluble and inert resinous substance.

5. In extract.

In this preparation we expect to possess the virtues of Peruvian bark in a very concentrated state. The principal objections to its use are its great expense, and the decomposition and destruction of the active constituents of the bark during the preparation, when not properly conducted. It is convenient for the formation of pills, and boluses, but we would always prefer a fresh infusion or decoction to any mixture in which the extract is redissolved.

Externally, Peruvian bark is used in substance, as an application to ill-conditioned, carious, or gangrenous ulcers.

In the form of clyster, it may be given in substance, decoction, or extract. The powder is used as a tooth powder for spongy and bleeding gums, and the decoction is an excellent astringent gargle or wash.

To increase the power of Peruvian bark, or to direct its efficacy to a particular purpose, or to correct some inconveniences occasionally produced by it, it is frequently combined with other remedies. When it produces vomiting, carbonic acid forms a useful addition; when it purges, opium; when it oppresses the stomach, aromatics; and when it induces costiveness, rhubarb. It may be also combined with other vegetable astringent or bitter remedies, without impairing its powers. But we are afraid that many additions are made, chiefly saline substances, of which the effects are not at all understood. Sulphuric acid, super-sulphate of alumina and potash (alum), muriate of ammonia, carbonate of potash, tartrite of potash, tartrite of antimony and potash (tartar emetic), iron, lime-water, &c. have been frequently

prescribed with it; but we know that in many of these mixtures decomposition occurs, which renders the whole either inactive, or completely deceives us with regard to its expected effects.

In addition to Dr. Duncan's observations relative to this important article, the following taken from Murray will not be deemed superfluous.

The effects of Peruvian bark are those of a powerful and permanent tonic, so slow in its operation that its stimulating property is scarcely perceptible by any alteration in the state of the pulse, or of the temperature of the body. In a large dose, it occasions nausea and headach; in some habits it operates as a laxative; in others it occasions costiveness.

It is one of those medicines, the efficacy of which in removing disease is much greater than could be expected a priori, from its effects on the system in a healthy state.

Intermittent fever is the disease for the cure of which bark was introduced into practice, and there is still no remedy which equals it in power.

The disputes respecting the mode of administering it are now settled. It is given as early as possible, with perhaps the previous exhibition of an emetic to evacuate the stomach; it is repeated in the dose of one scruple or half a drachm every second or third hour, during the interval of the paroxysm; and it may even be given with safety during the hot fit, but it is then more apt to excite nausea.

In remittent fever it is given with equal freedom, even though the remission of the fever may be obscure.

In those forms of continued fever which are connected with debility, as in typhus, cynanche maligna, confluent small-pox, &c. it is regarded as one of the most valuable remedies. It may be prejudicial, however, in those diseases where the brain or its membranes are inflamed, or where there is much irritation, marked by subsultus tendinum, and convulsive motions of the extremities; and in pure typhus it appears to be less useful in the beginning of the disease than in the convalescent stage.

Even in fevers of an opposite type, where there are marks of inflammatory action, particularly in acute rheumatism, bark has been found useful, after blood-letting.

In erysipelas, in gangrene, in extensive suppuration, and venereal ulceration, the free use of bark is of the greatest advantage.

In the various forms of passive hæmorrhagy, in many other diseases of chronic debility, dyspepsia, hypochondriasis, paralysis, rickets, scrofula, dropsy, and in a variety of spasmodic affections, epilepsy, chorea, and hysteria, it is administered as a powerful and permanent tonic, either alone, or combined with other remedies suited to the particular case.

Its usual dose is half a drachm. The only inconvenience of a larger dose is its sitting uneasy on the stomach. It may, therefore, if necessary, be frequently repeated, and in urgent cases may be taken to the extent of one ounce, or even two ounces, in twenty-four hours.*

The powder is more effectual than any of the preparations; it is given in wine, in any spiritous liquor, or, if it excite nausea, combined with an aromatic. The cold infusion is the least powerful, but most grateful; the decoction contains much more of the active matter of the bark, and is the preparation generally used when the powder is rejected; its dose is from two to four ounces. The spiritous tincture, though containing still more of the bark, cannot be extensively used on account of the menstruum, but is principally employed occasionally, and in small doses of two or three drachms, as a stomachic.

The extract is a preparation of considerable power, when properly prepared, and is adapted to those cases where the remedy requires to be continued for some time. It is then given in the form of a pill, in a dose from five to fifteen grains.

When children cannot take the bark, it may be applied in the form of a quilted waistcoat with complete success.

Cinchona Caribæa. *Cinchona of the Caribbean Islands.* The bark.

This species belonging to the same genus, a native of the Caribbee Islands, has been proposed as a substitute to Peruvian bark, and has, as such, been received into the Edinburgh Pharmacopœia. The bark comes in pieces about a span in length, rolled together, and a line or half a line in thickness, of a brown colour on the surface,

* In a case of mortification, Dr. Philip Syng Physick, of Philadelphia, exhibited bark to the quantity of from six to eight ounces in twenty-four hours, without its exciting any very unpleasant sensations.

which is most commonly covered with white moss. It has at first a sweetish taste, but after being chewed some time it becomes extremely nauseous and bitter. Dr. Wright says he made use of this bark in all cases where Peruvian bark was indicated, and with the greatest success.

CITRUS AURANTIUM. *Seville Orange.* The juice of the fruit and its external rind.

The juice of oranges is a grateful acid liquor, consisting principally of citric acid syrup, extractive, and mucilage; of considerable use in febrile or inflammatory distempers, for allaying heat, quenching thirst, and promoting the salutary excretions; it is likewise of use in genuine scorbutus, or sea scurvy. The china, or sweet orange, is to be preferred, as being more mild and less acid; and it is employed in its most simple state with great advantage, both as a cooling medicine, and as an useful antiseptic in fevers of the worst kind. The outer yellow rind of the fruit of the orange has a grateful aromatic flavour, and a warm bitterish taste. Both are extracted by water; and by distillation, a small quantity of essential oil is obtained. Its qualities are those of an aromatic and bitter. It has been employed to restore the tone of the stomach, and is a very common addition to combinations of bitters used in dyspepsia. It has likewise been given in intermittents, in a dose of a drachm twice or three times a day.

CITRUS MEDICA. *Lemon Tree.* The fruit, the rind of the fruit, and its volatile oil.

The juice of lemons is similar to that of oranges, from which it differs little otherwise, than in containing more citric acid, and less syrup. The quantity of the former is indeed so great, that the acid has been named from this fruit, acid of lemons, and is commonly prepared from it.

Lemon juice is one of the most cooling and antiseptic vegetable productions; and is of great utility in medicine. Sir John Pringle highly praises its efficacy in the sea scurvy; and it affords a grateful and cooling beverage for febrile patients; but it should be remarked, that this acid must never be freely given to persons whose breast,

or respiration is affected. Citric acid is a powerful and agreeable antiseptic. Its powers are much increased, according to Dr. Wright, by saturating it with muriate of soda. This mixture he recommends as possessing very great efficacy in dysentery, remittent fever, the dry bellyache, putrid sore throat, and as being perfectly specific in diabetes and lienteria. Citric acid is often used with great success for allaying vomiting; with this intention it is mixed, with carbonate of potash, from which it expels the carbonic acid with effervescence. This neutral mixture should be drunk as soon as it is made, or the carbonic acid gas, on which actually the anti-emetic powers of this mixture depend, may be extricated in the stomach itself, by first swallowing the carbonate of potash, dissolved in water, and drinking immediately afterwards the citric acid properly sweetened. The doses are about a scruple of the carbonate dissolved in eight or ten drachms of water, and an ounce of lemon juice, or an equivalent quantity of citric acid.

Lemon juice is also an ingredient in many pleasant refrigerant drinks, which are of very great use in allaying febrile heat and thirst. Of these the most generally useful is lemonade, or elicited lemon juice, properly sweetened. Lemonade, with the addition of a certain quantity of any good ardent spirit, forms the well known beverage, punch, which is sometimes given as a cordial to the sick. The acid of lemons is a known antidote against narcotic vegetable poisons, and among these in particular against opium. It has therefore been recommended that with every dose of opium a proportion of this acid in the quantity of two ounces to the grain, should be taken, by which means the uneasiness which that drug often communicates will be prevented, and its distressing consequences avoided. Hence the use of acids, to persons who are habitually obliged to take considerable doses of opiates, cannot be too strongly recommended. To the liberal use of vegetable acids are to be ascribed the slight effects which opium possesses over the Eastern nations, and not to the influence of coffee, as commonly alleged.

Either of the following methods is recommended for preserving the juice of lemons, or limes. Boil the juice after straining it, and bottle it; or squeeze the fruit; put the juice and pulp into a bottle; cover the top with an inch of oil; cork and rosin the bottle. The juice is sup-

posed to feed upon the pulp. Before using the juice, the pulp and oil must be carefully taken out.

The yellow peel is an elegant aromatic, and is frequently employed in stomachic tinctures, and infusions; it is considerably less hot than orange peel, and yields in distillation with water a less quantity of essential oil; its flavour is nevertheless more perishable, yet does not arise so readily with spirit of wine; for a spiritous extract made from lemon peel possesses the aromatic taste and smell of the subject in much greater perfection than an extract prepared in the same manner from the peels of oranges. In the shops a syrup is prepared from the juice, and the peel is candied; the peel is an ingredient in the bitter infusions and wines, the essential oil enters the volatile aromatic spirit, or spiritus ammoniæ compositus, as it is now called, and some other formulæ.

Coccus Cacti. *Cochineal.*

Cochineal is a small, irregular, roundish body, of a dark red colour on the outside, and a deep bright red within. It consists of an insect which derives its nourishment from the leaves of the *cactus coccinellifer*, or, as it is differently called, *nopal*, or *nopelleca*. This plant is found most abundantly in Mexico, and other parts of New Spain; and from its leaves cochineal insects are collected, and killed either by being immersed in hot water, or put into an oven moderately heated, or more advantageously, by being exposed to the scorching rays of the sun. These singular insects in their successive generations, are taken by the Mexicans three times in a year, carefully preserving over the winter in their houses such as may be necessary for breeders, while attached to the succulent leaves of the plant. No less than 800,000 pounds, each pound containing at least 70,000 insects, are imported annually into Europe, as a highly valuable colouring drug. They are principally consumed by the scarlet dyers, and for the purpose of making carmine. The best sort has been sold for one guinea the pound. It is remarkable that the dried insect may be kept unimpaired for an indefinite length of time.

The true cochineal has been found in South Carolina, and Mr. K. Peal of Philadelphia asserts, that he has discovered it upon the island of Little St. Simons, on the coast of Georgia. It is extremely desirable that the

insect, and the cactus coccinellifer plant on which it breeds, should be cultivated in the southern states. The planter might find it a valuable source of revenue, when, from vicissitudes in the season, their crops of rice or cotton should fail.

Cochineal is not employed in medicine, except for the purpose of imparting a beautiful red colour to some tinctures. Their colour is easily extracted, both by alcohol and water.

"*Cochineal* flourishes on the native nopal, or prickly pear of South Carolina. The insect thrives well, and increases and spreads on every leaf rapidly.

"The breeding of the cochineal is, however, attended with precarious circumstances; the insect is exposed to a variety of dangers from the violence of the winds, the rains, fogs, frosts, and other causes, and also from the depredations of birds, who are very fond of these insects."

Rees' Cyclo.

Cocos Butyracea. *The Mackaw Tree. Palm Tree.* The fixed oil of the nut, commonly called Palm Oil.

This oil is obtained from the kernel of the fruit of the palm tree; which is imported from the West Indies, whither the tree has been transplanted from Africa. It is of an orange colour, and of the consistence of ointment, emitting a strong agreeable odour, but having very little taste; both of which it entirely loses by long keeping, when it becomes unfit for use. It is chiefly employed externally, for mitigating pains, cramps, and similar affections: it is likewise used for the cure of chilblains, and, if early applied, has often proved successful. With camphor, palm oil makes a common, and very excellent liniment of the stimulating kind. Muriated ammonia, (sal ammoniac) in very fine powder, rubbed with camphorated palm oil, forms one of the most active and valuable liniments, as a discutient to indolent tumors, rigidity of the tendons, &c.

Cochlearia Armoracia. *Horse Radish.* The leaves and root.

An indigenous perennial plant, growing on the sides of ditches, the banks of rivers, and other damp places, flowering in the month of May. For medicinal and culi-

nary uses, it is also cultivated in gardens. Horse radish root has a quick pungent smell, and a penetrating acrid taste; it nevertheless contains in certain vessels a sweet juice which sometimes exudes upon the surface. By drying, it loses its acrimony; but if kept in a cool place, covered with sand, it retains its qualities for a considerable time.

The medicinal effects of this root are to stimulate the solids, and promote the fluid secretions; it seems to extend its action through the whole habit, and affect the minutest glands. It is greatly recommended by Sydenham in dropsies, particularly such as succeed intermittent fevers. In paralytic complaints horse radish has sometimes been applied with advantage as a stimulating remedy to the parts affected. When steeped in vinegar during a fortnight, this root is said effectually to remove freckles in the face. A syrup made by boiling scraped horse radi h in brown sugar, is an excellent remedy in the decline of colds and of pleurisies, to promote expectoration, and remove hoarseness.

COCHLEARIA OFFICINALIS. *Garden Scurvy Grass.* The plant.

This is an annual plant growing on the sea shore, and in mountainous situations, and is sometimes cultivated in gardens. It possesses a considerable degree of acrimony, and by distillation it affords an essential oil, the smell of which is so strong as to make the eyes water.

The fresh plant is a gentle stimulant and diuretic, and is chiefly used for the cure of the sea scurvy. It is employed externally as a gargle in sore throat, and scorbutic affections of the gums and mouth. It may be eaten in substance to any quantity, or the juice may be expressed from it, or it may be infused in wine or water, or its virtues may be extracted by distillation. Dr. Withering says it is a powerful remedy in the pituitous asthma, and in what Sydenham calls the scorbutic rheumatism. The juice is prescribed along with that of oranges, by the name of antiscorbutic juice.

COFFEA. *The Coffee Tree.* The fruit.

A shrub from twelve to eighteen feet high, originally a native of Arabia, but is now cultivated in the East and

West-Indies, and in several parts of America. The Arabian, or Mocha coffee, imported from the Levant, is far the most aromatic and resinous, and, on account of its superior flavour, is the most esteemed. Very various have been the opinions entertained by different physicians relative to the medicinal qualities of the coffee-berry; some inveighing against its use as a pernicious indulgence, others, on the contrary, are as vehement in its praise. It has been suspected of producing palsies; and Dr. Percival assures us, from his own observations, that the suspicion is not, altogether, without foundation. According, however, to the experiments, and, in the language of the same respectable author, coffee is slightly astringent and antiseptic; it moderates alimentary fermentation, and is powerfully sedative. Its medicinal qualities seem to be derived from the grateful sensation it produces on the stomach, and from the sedative powers it exerts on the *vis vitæ*. Hence it assists digestion, and relieves the headach; but in delicate habits it often occasions watchfulness, tremors, and many of those complaints denominated nervous.

The celebrated Sir John Pringle, bestows high encomiums on coffee, as a remedy in paroxysms of the periodic asthma. He directs the best Mocha coffee, newly burnt, and made very strong immediately after grinding it, an ounce to one dish, without milk or sugar, to be repeated after the interval of a quarter or half an hour, until relief be obtained. We are assured also, that Sir John Floyer, during the latter year of his life, kept free from, or lived easy under this afflictive complaint, by the use of strong coffee.

With respect to the medicinal properties of coffee, says Dr. Willich, it is in general excitant and stimulating, though we doubt whether it relaxes the animal fibres, as has by some authors been supposed. Its more or less wholesome effect greatly depends on the climate, as well as the age, constitution, and other peculiarities of the individual. Hence it cannot be recommended to children, or persons of a hot, choleric, nervous, or phthisical habit; nor will it be so useful in warm, as in cold and temperate climates; but to the phlegmatic and sedentary, a cup of coffee, one or two hours after a meal, or, which is still better, one hour before it, may be of service to promote digestion, and prevent or remove a propensity to sleep. In cases of spasmodic asthma, hypochondriasis, scrofula,

diarrhœa, agues, and particularly against narcotic poisons, such as opium, hemlock, &c. coffee often produces the best effects; nor is there a *domestic* remedy, better adapted to relieve periodical headachs which proceed from want of tone, or from debility of the stomach.

The heaviness, headach, giddiness, sickness, and nervous affections, which attack some persons in the morning, after taking an opiate at night, are abated by a cup or two of strong coffee.

Colomba. *Colomba.* The root.

Of the plant which furnishes this root, no botanical account has been obtained. It is brought from the town of Colombo in the island of Ceylon, in round pieces; the sides covered with a bark; the woody part of a bright yellow colour: It has an aromatic smell, and a bitter taste. It yields its bitterness to water, but proof spirit is its proper menstruum. The Colomba-root is a powerful antiseptic and bitter; it is used with much advantage in affections of the stomach and intestinal canal, accompanied with redundance of bile; it is also employed successfully in dyspepsia. Nor is it attended with any heating effect, and it may therefore be advantageously taken in pulmonary consumption and other heetical cases, both with a view to correct acrimony and strengthen the digestive organs. Its dose is half a drachm of the powder, which in urgent cases may be repeated every third or fourth hour. The use of this valuable drug has been particularly recommended to the attention of practitioners by Dr. Percival of Manchester, in his experimental essays; and it has been found to answer expectation; but it is to be regretted that it is not so regularly imported as to admit of our shops being supplied with it of good quality, it being frequently found either in a decayed or adulterated state. It has been discovered in the vicinity of the Ohio river in large quantities, and is said to be of an excellent quality. See Frasera Carolinensis.

Conium Maculatum. *Hemlock. Cicuta.* The leaves and seeds.

This is a large biennial umbelliferous plant, which grows very commonly about the sides of fields and hedges, and in moist shady places. The root is white, long, of

the thickness of the finger, contains when it is young a milky juice, and resembles both in size and form, the carrot. In the spring it is very poisonous, in harvest less so. The stalk is three, four, and often six feet high, hollow, smooth, and marked with red or brown spots. The leaves are large, and of a dark green colour, having a faint disagreeable smell, resembling the urine of a cat. The seeds are inferior in strength. The whole plant is a virulent poison, but varying very much in strength according to circumstances. When taken in an over dose, it produces vertigo, dimness of sight, difficulty of speech, nausea, putrid eructations, anxiety, tremors, and paralysis of the limbs: to which may be added dilatation of the pupils, delirium, stupor, and convulsions. But the internal use of this narcotic medicine was introduced by Dr. Stork, who found that in small doses, it might be given with safety. He recommended it particularly in scirrhus and in cancerous sores, in which it received a very extensive trial. While its inefficacy towards effecting a radical cure is established, its utility as a palliative medicine is generally admitted. It has likewise been found serviceable in scrofulous and venereal ulcerations, cutaneous affections, glandular tumors, chronic rheumatism, and various other diseases. In open cancer it often abates the pains, and is free from the constipating effects of opium. The dose is two or three grains of the powdered leaves, or one or two grains of the inspissated juice. It requires to be increased, in general, to a very considerable extent: at the same time, this must be done with caution, as both the dried leaves and inspissated juice are variable in their strength. In some cases the former have been increased to upwards of two ounces a day without producing giddiness. Dr. L. Valentine has furnished the public with a remarkable case at St. Domingo, of an inveterate disease of the bladder, attended by tetters and erysipelas, in which he prescribed the latter from six or eight grains to a drachm, and afterwards to three drachms per day. At the end of one year his patient had taken the quantity of four pounds; by which a radical cure was effected.* In this and in other well attested instances, salivation was induced by the use of hemlock.

The dried leaves are less liable to injury from keeping, than the inspissated juice. The leaves should be collected

* Med. Repository.

in the month of June when the plant is in flower, and its peculiar smell strong. The drying of the leaves should be performed quickly before a fire on tin plates, and the powder should be kept in phials closely stopped and secluded from the light, for this soon dissipates the green colour, and with it the virtues of the medicine. The proof of the drying having been well performed is the powder's retaining the odour of the leaves, and the deepness and freshness of the colour. Dr. Joshua Fisher, a highly respectable and intelligent physician of Beverly has experienced the beneficial effects of cicuta in a variety of cases of scrofulous affections of the abdominal viscera, and in phthisis pulmonalis. But in the hands of this accurate observer, cicuta has been found remarkably successful, as a remedy in jaundice occasioned by spasmodic contraction of the biliary ducts. He adduces a variety of instances in which the antispasmodic powers of this medicine were happily demonstrated, and cures completely effected.

Convolvulus Scammonia. *Scammony.* The gum resin.

This is a concrete gummy-resinous juice obtained from the roots of the *convolvulus scammonia*, or Syrian bind weed, an exotic plant growing in Asiatic Turkey. The best scammony is imported from Aleppo, in light, spongy, friable masses, of a shining blackish ash colour. It possesses a faint unpleasant smell, and a bitterish pungent taste. It consists of resin and gum, in general nearly in equal proportions. In its medicinal effects, scammony is an efficacious but violent purgative, employed chiefly in obstinate constipation. If triturated with sugar, almonds, or gum arabic, it becomes sufficiently mild, and safe in its operation. It may also be dissolved in a strong decoction of liquorice, in which form it is not disagreeable to the palate, and proves a gentle laxative. The common dose is from three to twelve grains. The true scammony plant has lately, it is said, been found in Sussex county, New Jersey; but with what prospect of its being productive, is not ascertained.

Convolvulus Jalapa. *Jalap.* The root.

The dried root of Jalap is imported from New Spain in thin transverse slices; solid and heavy, of a dark gray

colour, and striated texture. It has little smell, its taste is bitter and subacrid. The medicinal activity of Jalap resides principally if not wholly in the resin, which, though given in small doses, occasions violent griping. The gummy part bears an inconsiderable proportion to the resinous, and is found to have little or no cathartic power; but as a diuretic it is extremely active. That Jalap is an efficacious and safe purgative, daily experience must evince; and, except when given in very large doses, it is not heating to the system. If triturated with hard sugar it becomes in moderate doses a safe medicine for children, which in this form they will readily receive, as the Jalap itself has very little taste. Jalap in large doses, or when combined with mild muriate of mercury (calomel,) is recommended as an anthelmintic and a hydragogue. The dose of the simple powder is commonly from one scruple to two, but its efficacy is considerably increased by the addition of crystals of tartar. Dr. Rush's celebrated purgative in yellow fever, consists of ten grains of Jalap and ten of calomel, but double the quantity of the former has been found to be a more suitable proportion. Dr. Aiken asserts that fifteen grains of Jalap with two or three of ipecacuanha purge more than twice the quantity of Jalap by itself.

CONVOLVULUS PANDURATUS. *Wild Potatoe.* The root.

This is supposed by professor Barton, to be the mechameck, or wild rhubarb of some of our Indians. In the state of Delaware it is called wild-potatoe-vine; and the root kussander or kassader, (a corruption of the word cassada.) From one of our species of convolvulus, an extract has been procured, but little if any inferior to the scammony of the shops. In Virginia, and some other parts of the United States, the root of this plant has been much recommended in cases of gravel. It is used either in powder or in decoction. Dr. Harris, of New Jersey, has found an infusion, or decoction of the root, very useful in his own case. He is persuaded, that it has enabled him to pass the calculi renales with much facility.

COPAIFERA OFFICINALIS. *Copaiva Tree.* The liquid resin, called balsam of copaiva.

The tree which produces the balsam copaiva is a native of the Spanish West Indies, and of some part of the con-

tinent of South America. It grows to a large size, and the resinous juice flows in considerable quantities from incisions made in the trunk. It is thick and tenacious, with a yellowish tinge, has a peculiar not disagreeable smell, and a pungent bitter taste. It is soluble in alcohol and in expressed and essential oils. Distilled with water it affords nearly half its weight of an essential oil, an insipid resin being the residuum.

Balsam of copaiva increases the urinary discharge, and communicates to the urine a violet odour. In too large a dose, it excites inflammation of the urinary passages. From its power of stimulating these parts, it frequently proves successful in the cure of gleet. It has also been given in leucorrhœa and in hæmorrhoidal affections with advantage. It is an useful corroborating detergent medicine. It strengthens the nervous system, tends to loosen the bowels; and in large doses proves purgative, promotes urine, and cleanses and heals exulcerations in the urinary passages, which it is supposed to perform more effectually than any of the other resinous fluids. It has also been recommended in dysenteries, and in diseases of the breast and lungs. Very dangerous coughs have been cured by the use of this balsam alone; but it ought never to be given in coughs where inflammatory symptoms are present. In catarrhal affections to which old people are liable, it is an useful medicine. The dose should not exceed from twenty to thirty drops twice or thrice a day. A convenient way to take it is, to mix it up in brown sugar, drinking a glass of water after each dose, or it may be diffused in water by the medium of a mucilage of gum arabic.

Coriandrum Sativum. *Coriander.* The seeds.

The seeds of coriander have commonly been imported from the south of Europe; but the plant is frequently cultivated in our own gardens, and may be produced to any extent. It is an annual umbelliferous plant, and the seeds differ from all the others of that class in being spherical. These possess a pleasant flavour; and when encrusted with sugar are sold by the confectioners under the name of *coriander comfits*. Their taste is moderately warm. Like caraway, they are used as carminative, and likewise to cover the taste and flavour of some medi-

cines, particularly senna, when given under the form of infusion or tincture.

CORNUS FLORIDA. *Common Dogwood. Boxwood.* The fruit and bark.

This is one of our most beautiful and useful shrubs, growing in almost every part of the United States. In New England it is well known by the name of boxwood. It flowers very early in the Spring, and with so much regularity that some of our southern tribes were accustomed to name the Spring season from its flowering. The flowers generally make their appearance about the beginning of May, in the middle States, and exhibit a most beautiful appearance. The large white flowers form a fine contrast with the green of the forest, and are the ornament of our woods. These are succeeded by oblong drupes or berries of a rich glossy crimson colour which ripen in September. They have a very bitter taste, and an infusion of them in rum or brandy is much esteemed as an agreeable morning bitter. The bark both of the stem and root, is considerably astringent, and has long been employed in intermittent fevers. And as possessing properties closely allied to the Peruvian bark, this and the following article will be found excellent substitutes.

Cornus Sericea, or American red-rod cornel. Called also red willow; swamp dogwood; blue berried dogwood. This agrees in its generic character with the cornus florida. It grows in a moist soil by the sides of creeks and rivers and in swamps, seldom attaining in height more than six or eight feet. In general a considerable number of stems arise from the same root and are very straight. The bark of the young shoots is very smooth, shining, and of a rich dark red colour. The branches are placed opposite, as are also the leaves which a good deal resemble the cornus florida. The flowers are produced in clusters or cymes at the extremity of every branch, and give to this shrub a very elegant appearance, being of a whitish colour in June and July. They are succeeded by succulent drupes or berries, which are of a blue colour inclining to green when ripe.

Both these American species of cornel are found by experiments instituted by Dr. John M. Walker to possess the same ingredients with cinchona. The bark of cornus sericea forms a beautiful tincture with proof spirit,

which has been useful in the latter stages of diarrhœa unaccompanied with fever. This and the powdered bark of both species are well deserving a place in the apothecaries' shops, as valuable additions to our Materia Medica. It is asserted by Dr. Walker that in whatever form of disease the cinchona has been decidedly serviceable, the cornl will be found equally so. They are like cinchona bark, bitter and astringent in the mouth, tonic and febrifuge in the stomach; and their chemical analysis affords results perfectly analogous. Thirty-five grains of powdered bark of dogwood is considered equal to thirty of cinchona. Professor Barton adds his decided testimony relative to the efficacy of dogwood as a valuable substitute for the Peruvian bark in the cure of intermittent fevers.

This article as a remedy has attracted the attention of medical practitioners of the United States, many of whom have vouched for their tonic and astringent powers, as being little if any inferior to those of cinchona officinalis. If therefore our native productions are adequate to our exigencies let expensive exotics be rejected.

CROCUS SATIVUS. *Common Saffron.* The summit of the pistils, called saffron.

Saffron is a bulbous rooted perennial plant, very generally cultivated in gardens in European countries. The smell of saffron is pleasant and aromatic, but narcotic; the taste a fine aromatic bitter, and it immediately gives a deep yellow colour to the saliva, when chewed.

The active matter is equally extracted by alcohol, water, proof spirit, and vinegar. Saffron is remarkably fragrant, and is highly esteemed, as it exhilarates the spirits when taken in small doses; but, if used in too large portions, it produces immoderate mirth, and all the consequences resulting from the abuse of spirituous liquors. This drug was formerly considered an excellent remedy in hysteric depressions originating from spasms, or in obstruction of the uterine secretions; but in modern practice it is seldom employed, though it enters into several medicinal preparations. The best saffron is that raised in England: it ought to be of a deep red or orange colour, fresh and tough, though neither too dry nor too moist, and of a strong but pleasant aromatic odour. The common saffron of our gardens, if properly

prepared by moistening with brandy and pressing into cakes, will be found a tolerable substitute for the imported drug.

Croton Eleutheria. *Cascarilla.* The bark.

This bark is imported from the Bahama Islands, particularly from one of them of the name of Eluthcria, whence its title is derived. But Dr. Wright also found the tree on the sea shore in Jamaica, where it is common, and rises to about twenty feet. It is imported in the form of curled pieces, or rolled up into short quills about an inch in width, externally resembling the Peruvian bark. Divested of its whitish upper rind, the cascarilla possesses an agreeable smell, and a bitterish, pungent aromatic taste. This inflammable drug, when burning, emits a fragrant odour, not unlike that of musk.

The cascarilla is frequently and successfully administered in intermittent fevers, even as a substitute for the *cinchona;* being less liable to produce the inconveniences which the latter is apt to occasion by its astringency. Cascarilla, according to medical writers, has also been employed with uncommon advantage in dangerous epidemic and *petechial* fevers, in flatulent colics, internal hæmorrhages, dysenteries, and diarrhœas. The virtues of cascarilla are partially extracted by water, and totally by rectified spirit, though it is more efficacious given in powder from ten to thirty grains every four, six, or eight hours.

Cucumis Colocynthis. *Colocynth. Bitter apple.* The pulp of the fruit.

This article is the produce of Syria and the island of Crete. The fruit is yellow, of the size of an orange, and resembles a gourd, the shell of which contains a very light, white pulp, interspersed with flattish seeds. It is this spungy or medullary part of the fruit, when dried, that is used in medicine. Its taste is intensely bitter. Boiled in water it gives out a large portion of mucilage, less active than the colocynth itself. Alcohol also dissolves only part of its active matter.

Colocynth is one of the most drastic purgatives, so much so that its operation is not easily regulated. Its dose is from three to six grains, but it is seldom that it is given by itself, being rather used to promote the opera-

tion of other cathartics. Combinations of it with jalap, aloes, or mild muriate of mercury, are thus given in obstinate constipation, in mania and coma; and in these combinations it operates more mildly and more effectually than if given alone. Its infusion has been recommended as an anthelmintic. But as we are possessed of numerous native plants of similar and much milder virtues, there appears to be no necessity for employing this exotic.

Cuprum. *Copper.*

This has a more perceptible smell and taste than any other metal. Its effects, when taken into the stomach, are highly deleterious, and often fatal. It particularly affects the primæ viæ, exciting excessive nausea, vomiting, colic pains, and purging, sometimes of blood, or, though more rarely, obstinate constipation. It also produces agitation of the mind, headach, vertigo, delirium; renders the pulse small and weak, the countenance pale, and causes fainting, convulsions, paralysis, and apoplexy. When any of these symptoms occur, we must endeavour to obviate the action of the poison by large and copious draughts of oily and mucilaginous liquors; or to destroy its virulence by solutions of potash, or sulphuret of potash.

Great care ought to be taken that acid liquors, or even water, designed for internal use, be not suffered to stand long in vessels made of copper; otherwise they will dissolve so much of it, as will give them very dangerous properties. But although copper be thus dangerous, some preparations of it are, in certain cases, used with great advantage, both internally and externally. Its tonic power, like that of zinc, is estimated by its successful exhibition in epilepsy, and some other spasmodic diseases, depending on, or connected with debility.

According to Dr. W. Saunders, copper is of all the metals the most astringent and most soluble in the stomach; but on account of the uncertainty of acid in the stomach the dose is difficultly ascertained, and it is rarely used. Preparations of copper, however, when the intention is to lessen irritability, are extremely useful, particularly in hysterical cases attended with plethora, and in epileptic spasms. Copper is the basis also of a quack remedy for the prevention and cure of hydrophobia, and in this view it is probably deserving of attention.

Curcuma Longa. *Turmeric.* The root.

Turmeric is a perennial plant, a native of India. The roots are tuberous, knotty, long and wrinkled; externally of a pale yellow colour, internally of a shining saffron brown. They have a weak aromatic smell, and a slightly bitter aromatic taste. Turmeric, taken internally, tinges the urine of a deep yellow colour, and acts as a gentle stimulant. It has been celebrated in diseases of the liver, jaundice, cachexy, dropsy, intermittent fevers, &c. Its internal use is now generally dispensed with; and it is only esteemed as affording a valuable yellow dye. Turmeric is a production of the United States, being found on the borders of the Ohio river.

Daphne Mezereum. *Mezereon. Spurge Laurel.* The bark of the root.

An indigenous low shrub, growing in woods and shady places, and flowering in the month of February or March. When cultivated in gardens, it attains in a rich soil, the height of sixteen feet. It has no cup but a funnel-shaped corolla of one petal inclosing the stamins, and the border cut into four segments. The fruit is a berry, in which is found a single seed. The leaves are spear-shaped, and the flowers grow by threes from the same joint sitting upon the stem, and are of a beautiful red or rose colour. The whole of this plant is so corrosive, that six of its berries are said to kill a wolf. The bark of the root of this plant, is the part used in medicine; its taste, when chewed for some time, is extremely acrid, exciting an insupportable sensation of burning in the mouth and throat. Its acrimony is somewhat impaired by drying. It is extracted by water and vinegar. Mezereon is a stimulating diaphoretic, which, by determining to the surface, has been found of service in chronic rheumatism, and in cutaneous diseases. Its principal use has been in syphilis, as being particularly efficacious in removing venereal nodes, and thickening of the ligaments and periosteum, and disposing ulcerations to heal. It is given in the form of decoction; two drachms of the bark, with half an ounce of liquorice root, being boiled in three pounds of water, to two pounds, and four or six ounces of this given four times in a day. It is generally combined with sarsapa-

rilla: such a combination, forms the *decotum sarsaparillæ compositum*, an improved formula for the Lisbon diet drink. Dr. Withering has found this bark serviceable in removing a difficulty of swallowing, and asserts, that a patient who lived under extreme difficulty of swallowing for three years, was effectually cured in two months, by chewing the root of mezereon as often as she could support its irritating effects. This bark, when applied to the skin in its recent state, or infused in vinegar, is effectual in raising a blister, and is sometimes employed for the purpose of keeping up a perpetual discharge, for the removal of some chronic local affections. From the ripe berries of this plant, an excellent red lake is prepared by painters. Mezereon grows plentifully in the vicinity of the Ohio river.

DATURA STRAMONIUM. *Thorn Apple. Apple Peru.*
The leaves and seeds.

The thorn apple is a native of America, growing wild among rubbish and on dung hills. It has a large branched purple coloured stalk spreading and rising to three or four feet in height. It is said not frequently to be produced at a distance from the sea coast. It flowers in July and August, having an oblong cup of one leaf divided into five angles and five teeth. The corolla is funnel shaped and plaited, white with a tinge of purple. The capsule is large, egg shaped, and covered with thorns which has four divisions, and grows upright upon the remains of the cup; and contains numerous black kidney shaped seeds. The leaves are large, egg shaped, pointed, angular, and deeply indented, of a disagreeable smell and nauseous taste. At night some of the upper leaves rise up and enclose the flower. In the southern states this plant is called jamestou or jimson weed, sometimes stink weed. The species, or the variety called green stramonium is described as having a green or pale coloured stalk and white flowers, and is often found growing with the purple stalk variety. The *Datura Tatula* is larger than the stramonium, the stalk is purple, sprinkled with white spots, and the flowers are purple. The leaves are also larger and more angular and notched, the capsules of a larger size, and their spines more substantial. This last species it is supposed is seldom if ever found in New-England.

Every part of this plant is a strong narcotic poison, and numerous instances are recorded of children having suffered the most alarming consequences from having swallowed the seeds. Immediately after their being received into the stomach, dilatation of the pupils, vertigo, delirium, tremor, itching, eruption, insupportable thirst, and palsy ensue; which if not remedied soon, terminate in death. The most effectual antidote will be speedy emetics, followed by copious draughts of olive oil, aided by soap clysters, and catharties. According to Baron Stork and other German physicians, the inspissated juice of the leaves of this plant has been successfully employed in maniacal cases, and in convulsive and epileptic affections.

Professor Barton of Philadelphia, esteems it as a good stimulant and diuretic, and as a medicine possessing great and invaluable powers. He has frequently exhibited it with success in cases of mania and epilepsy. The form in which he chiefly employed it, is that of an extract prepared from the fresh leaves, and this in large doses; beginning with a few grains, he increased it gradually to the extent of fifteen or twenty grains.

We have also the respectable authority of Dr. Fisher of Beverly, in favor of the efficacy of Stramonium in the cure of epilepsy. From his extensive experience it appears, that great confidence may be reposed in the virtues of this medicine in effecting a radical cure in those cases of young persons where the fits occur daily, or monthly, at regular periods, especially if assisted by chalybeates, or such other medicines as particular symptoms appear to require. He observes that the patient must be kept constantly under the influence of the medicine; for this purpose, he will require every day one or two doses, according to the severity of the symptoms. The saturated tincture, he says, is the most convenient form for children. The requisite dose may be known by the dilatation of the pupils.

The stramonium having displayed its efficacy under the prescription of numerous physicians, its character seems to be established, and the use of it is extended to a variety of diseases. As a remedy in epilepsy it is unquestionably one to be relied on even in some of the most deplorable examples. Though its failure is not unfrequently to be expected, its efficacy has often surpassed that of all other remedies. A lady aged about fifty-five years, having for some months been afflicted with alarming attacks of epi-

lepsy, by which her powers of intellect and of articulation were impaired, happily experienced a restoration by taking one grain of the extract once or twice in twenty-four hours. Although she did not suffer another attack after commencing the course, she found it necessary to continue in it during several months to remove all apprehension of a recurrence. A single grain seldom failed to excite unpleasant vertiginous sensations, accompanied with an efflorescence about her face and some degree of sleepiness. In another instance a man took fifty grains daily, divided into two doses, which constantly obviated a recurrence of the fits, though it produced dilated pupil, blindness, and sleepiness.

In some spasmodic affections of the breast and lungs, as asthma and spasmodic cough, stramonium is said to have proved essentially beneficial. Reports have been made in favor of the salutary effects which asthmatic patients have derived from the practice of smoking stramonium; but no authenticated fact of this nature has occurred, and we are, on the contrary, apprized by Dr. Bree, that in England, the practice of smoking this plant has in a very considerable number of instances been attended with injurious or fatal consequences.

Lately it has been announced that stramonium has effected cures in some obstinate cases of amenorrhœa. As this medicine will sometimes produce unpleasant sensations, and even alarming effects, it is not to be administered without some precaution.

A medical gentleman was called to a family, eight of whom were suffering the noxious effects of stramonium, the leaves of which had been eaten at table mixed with other vegetables. They exhibited a scene scarcely to be described, and formed a group in which were manifested the symptoms designating the various grades from idiotism to mania; such as torpor, or abolition of sense, slow pulse, vertigo, tremor, wild delirium and raving, with glaring eyes and dilated pupil. They all recovered in about twenty-four hours by the use of strong emetics.

The extract may be made by boiling the bruised seeds or fresh leaves in water for the space of four hours; then strain off the liquor; evaporate over a gentle fire, without taking off the scum, until it has acquired the thickness of syrup; then place it in a warm oven, in an earthen glazed vessel, until it becomes of a proper consistence for use. The dose is from one to ten grains or more for an adult. An ointment prepared by simmering the fresh

leaves in hogs lard, affords great relief in external inflammations, and especially in the piles. It is also highly useful in burns, and in allaying the swelling of a cow's udder. The leaves applied to the feet or part affected have been found efficacious in removing spasm.

Daucus Carota. *Wild Carrot.* The seeds.

The seeds of wild carrot have a moderately warm pungent taste, and an agreeable aromatic smell. They are carminative, and are said to be diuretic. The roots of the cultivated variety, *common carrot*, contains much mucilaginous and saccharine matter, and are therefore highly nutritious and emollient. When beaten to a pulp, they form an excellent application to cancerous and other ill-conditioned ulcers, allaying the pain, checking the suppuration and fœtid smell, and softening the callous edges. A marmalade of carrots, on account of their strong antiseptic qualities, has been successfully used for preventing and curing the sea-scurvey. An infusion of these roots has also been found to afford considerable relief to persons afflicted with the stone and worms, but especially the tape worm.

Digitalis Purpurea. *The purple or common Foxglove.* The leaves.

This is a biennial plant not indigenous to the United States, but of late cultivated in our gardens. The plant rises to two feet or more, the leaves are large, oblong, egg shaped, soft, covered with hairs, and serrated. They have a bitter very nauseous taste, with some acrimony. The flowers are in long terminating spikes. Blossoms appear in June and July, of the second year, of a beautiful purple colour, elegantly mottled in the inside with spots like little eyes. All its parts are powerfully narcotic, but the leaves being most uniform in strength, are preferred for medicinal use. They are to be collected when the plant is in blossom, and dried before a gentle fire, the thicker stalks being removed: and they ought to be kept without being reduced to powder.

The operation of digitalis on the system is extremely peculiar, and there is even considerable difficulty in ascertaining its real effects. In a full dose, it produces exhaustion of power, marked by a great and sudden re-

duction in the force of the circulation; the pulse being reduced both in frequency and force, falling sometimes from seventy to forty or thirty-five beats in a minute, and being small and tremulous. This is accompanied with sickness, anxiety, vertigo, dimness of vision, and, in a large dose, with vomiting, syncope, coldness of the extremities, convulsions and coma, with sometimes a fatal termination. Yet these effects are not uniform, but even from the same dose we observe considerable diversity of operation in different individuals: thus the pulse is sometimes rendered lower without being diminished in fulness; at other times it is rendered irregular: nor does sickness always accompany the reduction of the force of the circulation. Sometimes none of these effects, and scarcely any perceptible change in the state of the functions are immediately apparent; but if the dose be continued, they are suddenly produced. Effects are even observed, from the operation of foxglove, apparently of a very opposite kind. While it reduces the force of the circulation, it appears to increase the action of the absorbent system, and hence proves a powerful remedy in dropsy; and Dr Withering, by whom its powers were first particularly investigated, observed, that when given in a state of disease, it was most successful, not where there existed increased action in the system, but, on the contrary, in states of debility, where the pulse was feeble and intermitting, and the countenance pale. Other authors have remarked its stimulant operation; and Dr. Sanders, from a series of observations and experiments, has inferred, that it always acts primarily as a stimulant, augmenting when given in a dose not too large, the force and frequency of the pulse, and inducing a state of increased action; it is only when it is accumulated by repetition, or by too large a dose, that reduction of the force of the circulation and other symptoms of diminished power are produced; and hence, according to this view, it is strictly analogous in its operation to other narcotics.

It must be admitted, however, that it is more difficult to regulate the administration of digitalis, so as to obtain its continued stimulant operation, than it is with regard to other stimulants; that there is a rapid transition to a state of diminished action, and that this is greater, and more permanent, compared with the primary stimulant effect, than in other stimulants even of the diffusible kind.

Foxglove, producing very different effects according to the mode in which it is administered, or according to the state of the system, is employed as a remedy in different diseases. On its action as a narcotic, in part at least, has been supposed to depend the advantage derived from it as a remedy in phthisis pulmonalis. When given to that extent in which it reduces the velocity and force of the circulation, it proves useful, by counteracting that state of increased action which prevails in the incipient stage of the disease; and by diminishing the rapidity of the circulation through the lungs, it may facilitate the removal of the local affection. In the more advanced stages, it may operate, it has been conceived, by promoting absorption, thus removing the tuberculous affection, or withdrawing the purulent matter, before it has been rendered acrid by the action of the air. Sanguine expectations have been formed of the advantages to be derived from it in the treatment of phthisis, many of the symptoms disappearing under its use, and the progress of the disease appearing to be arrested. The change of organic structure is, however, so considerable, at least in the advanced state of the disease, as scarcely to admit of a cure from the operation of any remedy; and the operation of foxglove is so much diversified, that perhaps the proper mode of administering it has not been precisely determined, so as to admit of all the advantage being received from it that might be derived: it is difficult, as Dr. W. Hamilton has remarked to give it so as to reduce the force of the circulation, and continue this effect, without its inducing other consequences, which compel us to relinquish its use.

Foxglove has been proposed as a remedy in pneumonia, from its power of reducing the force of the circulation when given in a sufficient dose, conjoined with bloodletting; and cases have been related of the success attending the practice, while some authors have condemned it as hazardous, from the excitement it is liable to produce. On a similar principle, it has been proposed to be employed in croup.

In active hæmorrhage, it might be expected, from the same operation, to be a remedy of much power; and, according to the observations of Ferriar and others, it may be employed with signal advantage in epistaxis, hæmoptysis, and menorrhagia, either alone or in combination with opium. In spasmodic asthma, the combination of it with opium has afforded much relief. In palpi-

tation arising from intemperance, or from passions of the mind, and not connected with dyspepsia, the irregular action of the heart has been abated, and at length entirely removed by its operation.

Foxglove is given in substance, or under the form of infusion, decoction, or tincture.

The medium dose of the powder of the dried leaves is half a grain; the dose of the infusion prepared according to the formula of Withering, now received into the Pharmacopœias, is half an ounce; that of the tincture is fifteen drops; these quantities being given twice a day. The decoction is an improper form, as being variable in strength. The tincture is the form of preparation under which it has usually been given as a narcotic: the infusion that in which it has been employed as a diuretic. Given in substance, there is supposed to be rather more risk of its effects accumulating from repetition of the dose, so as to induce unpleasant symptoms which arise from an over dose.

To obtain the full narcotic operation of foxglove, the dose given at first requires to be gradually increased, but this increase must be made with much caution, not only from the hazard attending an over dose, but from the circumstance that the action of the remedy is for a time not apparent; but if the dose has been too large, or repeated at intervals not sufficiently distant, it appears suddenly, and continues progressive. Hence the necessity of the practitioner's watching with the greatest attention the effects it produces. The augmentation may proceed at the rate of one-fourth of the original quantity every second day, and the dose should not be repeated more than twice, or at farthest thrice a day, unless in acute diseases, where the effect must be more speedily obtained, and where, therefore, the augmentation must be more rapid. The increase is continued until the effect intended to be obtained from the remedy is produced, or until its operation is apparent on the system; and whenever the pulse begins to diminish in frequency or force, the increase of dose must be stopt; and if the reduction be considerable, or proceed rapidly, the administration of the remedy must be suspended, and, only after a sufficient interval, cautiously renewed. This is more especially necessary when nausea is induced, dimness of vision, vertigo, or any tendency to fainting. When these symptoms do occur, they are best obviated by small doses of

stimulants, as spirituous cordials warm; sulphuric ether, aromatic spirit of ammonia, bitter infusions, and aromatics, small doses of opium, and a blister applied to the region of the stomach. Vinegar, which is an antidote to other narcotics, might also be tried.

Foxglove has been considered as a narcotic; it is a still more important article of the materia medica as a diuretic. It had frequently been used as an empirical remedy in dropsy; but the occasional violence of its narcotic operation, when not administered with due precaution, prevented it from being employed in practice, until Dr. Withering pointed out, with more precision, the rules to be attended to in its exhibition.

It is difficult to compare the powers of the principal diuretics; yet, on the whole, perhaps foxglove is superior to all of them in evacuating the water in dropsy: and the conclusions of Withering are still nearly just, that "so far as the removal of the water will contribute to cure the patient, so far may be expected from this medicine; and that although digitalis does not act universally as a diuretic, it does so more generally than any other."

In hydrothorax, its superiority to other diuretics is more clearly established than in ascites or anasarca; and in the first of these states of dropsy, it is unquestionably superior to any other remedy. Withering remarked, that it was most successful in those cases of dropsy in which debility was completely marked, where the countenance is pale, the pulse weak, and the muscular energy reduced, while, in an opposite state of the system, it was more liable to fail. In the latter case, therefore, he recommended a previous exhibition of squill, or of supertartrite of potass, by which some reduction of strength might be induced. The observation, however, has not altogether been confirmed by subsequent experience. If it were, it would afford a strong presumptive proof, that the efficacy of foxglove in dropsy depends on its stimulant action.

There is a peculiarity in its operation, that it may be continued for some time without sensibly increasing the flow of urine; the increase then suddenly commences, and continues of itself without requiring the continued administration of the remedy for several days, and to a very great extent, so that the dropsical effusion is more speedily reduced by the action of it than by any other diuretic. Its diuretic power too appears only when it is administered

in dropsy, and hence there can be little doubt that it operates principally, if not entirely, by exciting the action of the absorbents. The absorbed fluid is then discharged by the kidneys. The diuretic effect is not connected with its nauseating operation, or with the reduction in the force of the circulation; it can, on the contrary, be obtained without either of these accompanying it; and Withering remarked even, that he had found the increased discharge of urine to be checked, when the doses had been imprudently urged so as to occasion sickness. He observed also, that if it purges, it is almost certain to fail.

The great desideratum with regard to this remedy, is to conduct its administration so as to obtain its full diuretic effect, without those consequences which arise from it, when its action is accumulated in the system. The rules given by Withering for its administration, are to give it in a dose from one to three grains of the powder twice a day; or one ounce of the infusion, which, if the symptoms be urgent, or the patient stronger than usual, may be given once in eight hours: and the dose is to be continued until the medicine either acts on the kidneys, the stomach, the pulse, or the bowels; and is to be stopped on the first appearance of any of these effects. If however the dose be small and given twice in twenty-four hours, the diuretic operation will be obtained in no long time without any unpleasant symptom, and when it commences, will continue of itself, even though the dose be suspended.

Foxglove may in the treatment of dropsy, be advantageously combined with other diuretics; and its action, like that of squill, is said to be promoted by the operation of mercury.

There are other diseases in which foxglove has been supposed to prove useful by its diuretic power; as in insania, or in epilepsy connected with serous effusion in the brain; and more especially in dyspnœa arising from serous effusion in the bronchiæ. It is employed also with much advantage in humoral asthma, and in catarrh, obviously from its power of promoting absorption. By diminishing the quantity of the fluid accumulated in the lungs, it facilitates the expectoration of the remainder, and hence appears to act as an expectorant. In aneurism of the aorta, digitalis has been found to alleviate the most distressing symptoms. Two cases of phthisis are mentioned by Dr. Walmsley in which this remedy induced a

copious ptyalism which lasted some time, but without producing any beneficial effect. In the second case, the ptyalism was a second time induced by its use.

Dr. Currie, late of Liverpool, extols in strong terms the efficacy of foxglove in allaying the inordinate action of the heart and arteries, and in this view he considered it as one of the greatest benefits our science has received in modern times. He employed it very extensively in cases of phlegmasiæ, hæmorrhagia and dropsy, inflammation of the brain, of the heart, and of the lungs, and found it also an excellent remedy in inflammatory rheumatism. Its efficacy in this last disease has been confirmed by more recent experience.

The infusion of foxglove has been applied externally as an anodyne lotion to painful cutaneous eruption or ulceration. An ointment composed of the powder mixed with lard, has been found successful in obstinate tinea capitis.

In the United States practical inquiries into the medical properties of digitalis have been prosecuted with uncommon zeal, and although uniformity of opinion is far from prevailing, every practitioner who has adopted the use of it, will allow that it is one of the most active medicinal agents. Dr. Isaac Rand, a physician of eminence in Boston, and Dr. John Spence, a respectable practitioner in Virginia, have from their own experience furnished unquestionable attestations of its efficacy in the early stages of phthisis pulmonalis. Although Dr. Rand does not think with Dr. Beddoes, that foxglove is as infallible a remedy in consumption as mercury in lues venerea, and bark in intermittents, he asserts that he has cured more by this medicine than by all and every other medicine conjoined. He has also experienced the most decided good effects from the use of digitalis in hæmoptysis, epistaxis, and active hæmorrhages from the uterus. In one instance of hæmoptysis in a very athletic young man, where the discharge eluded the force of every other medicine, it reduced the pulse in eight hours from one hundred in a minute to fifty pulsations, and stopped the hæmorrhage. He has given it with complete success in a case of mental derangement. Such are the active and virulent qualities of this plant that it ought not to be entrusted to the direction of the inexperienced practitioner; nor resorted to without due attention to the state of the system; and when administered, its peculiar effects should be discriminated with the utmost vigilance and precision. Dr. Rand

relates for admonition one melancholy example of the fatal effects of digitalis, in a man who having experienced relief from its use, adventurously exceeded the extent enjoined by his physician.

It should be observed that there is a singularity attending the operation of foxglove noticed by a writer in the third volume of the Edinburgh Medical Journal, and also by Dr. Hamilton in his treatise on digitalis, and some others, which appears to merit attention in its administration. That its action is considerably influenced by the different positions of the patient's body, whether erect or recumbent. In one case of phthisis, after taking this medicine, the pulse was not lessened in frequency when the patient stood erect, being upwards of an hundred. When he sat down it fell considerably, and when lying on his back it fell much more. When sitting it was reduced to seventy-five, and when lying, to forty. The experiment was repeated many times, and always with the same effect.

Dr. Mease, of Philadelpia, being of opinion that not unfrequently disappointment to the expectations of the prescriber is to be attributed to the improper manner of preparing and exhibiting digitalis, advises physicians to cultivate the plant for their own use, and to observe the greatest care in preserving the leaves, rejecting the leaf stalk and middle rib. Some farther observations relative to this important plant will be found under its several preparations.

Dolichos Pruriens. *Cowhage.* The stiff hairs which cover the pods.

An exotic plant growing in warm climates, especially the West Indies. The pods are about four inches long, round, and as thick as a man's finger. The outside of the pods is thickly beset with stiff brown hairs, which, when applied to the skin, occasion a most intolerable itching. The ripe pods are dipped in syrup, which is again scraped off with a knife. When the syrup is rendered by the hairs as thick as honey, it is fit for use. It acts mechanically, as an anthelmintic, occasions no uneasiness in the primæ viæ, which are defended by mucus, and may be safely taken from a tea spoonful, to a table spoonful, in the morning, fasting. The worms are said to appear with the second or third dose, and, by means of a purge, in some cases the stools have consisted entirely

of worms. A decoction of the roots of cowhage is esteemed a powerful diuretic, and a vinous infusion of the pods (twelve to a quart) is said to be a certain remedy for the dropsy; the dose half a pint when made into beer.

Mr. Kerr has given a botanical description of the plant in the Medical Commentaries, vol. ii.

DORSTENIA CONTRAJERVA. *Contrayerva.* The root.

This plant is perennial, and grows in South America, and some of the Caribbean Islands. The root is knotty, an inch or two in length, and about half an inch in thickness; externally of a reddish brown colour; and pale within; long, rough, slender fibres shoot out from all sides of it, and are generally loaded with small, round knots. It has a peculiar kind of aromatic smell, and a somewhat astringent, warm, bitterish taste, with a slight, and sweetish kind of acrimony when long chewed. Contrayerva is a gentle stimulant and diaphoretic, and is sometimes given in exanthematous diseases, typhus, and dysentery. Its dose is about half a drachm of the powdered root.

EUGENIA CARYOPHYLLATA. *The Clove Tree.* The flower bud, and its volatile oil.

This is a beautiful tall tree, a native of the Molucca Islands. Cloves are the unexpanded flowers, which are dried by fumigating them, and exposing them to the sun. They have a strong aromatic odour, and a pungent taste. They afford to water their flavour principally; to alcohol, their taste. By distillation with water, they yield a fragrant essential oil, not very pungent. The oil of cloves, commonly met with, is rendered acrid by certain additions.

Cloves are among the most stimulating aromatics: the dose of them does not exceed from five to ten grains. They are employed principally as adjuvants, or corrigents to other medicines. The essential oil is used with the same intention, and likewise, as a local application in toothach; but from its pungent nature, it is apt to corrode the gums, and injure the adjacent teeth.

EUPATORIUM PERFOLIATUM. *Thorough Wort.* The leaves and flowers.

This is a native annual plant, flourishing abundantly in wet meadows and other moist places. The stalk is hairy and rises from two to four feet, perforating the leaves at each joint, from which it is sometimes called thorough stalk, or stem. The flowers are white and appear in July and August, forming a corymbus at the termination of the branches. The leaves at each joint are horizontal, serrated and rough, from three to four inches long, and about one inch broad at their base, gradually lessening to a very acute point, of a dark green, and covered with short hairs. Thorough wort certainly possesses active properties, and deserves the attention of American physicians. It acts powerfully as a sudorific and emetic, and sometimes as a purgative, and has been successfully employed in intermittents and other fevers, either in decoction or the leaves in powder. Every part of the plant may be advantageously employed, though the flowers appear most active. A watery infusion of the leaves is a powerful and not disagreeable bitter, and the flowers are deemed superior in this respect to those of camomile, and ought to be kept in the shops. The dried leaves in powder, or made into pills with lenitive electuary, given in doses of twelve or fifteen grains, are of excellent effect as a mild laxative, obviating costiveness without inducing debility or heat; correcting bile and promoting perspiration. This plant is frequently employed in the country as a drench in diseases of cattle. There are several species in the United States.

EUPATORIUM PILOSUM. *Wild Horehound.* The leaves.

This species of Eupatorium is also an annual plant; it rises from one to two feet. It grows wild in abundance in the southern states, where it has acquired great repute as a domestic remedy in the prevalent fevers of that climate. We are indebted to the honourable George Jones, Esq. president of the Georgia medical society, for the following sketch of its medical virtues. "It serves as an excellent substitute for the Peruvian bark; indeed, among the planters on or near the sea board it supersedes the use of the bark in the cure of fevers. It is tonic, dia-

phoretic, diuretic, and mildly cathartic, and does not oppress the stomach as the Peruvian bark is apt to do; hence it may often be exhibited where the cinchona is inadmissible. It is usually exhibited in the form of infusion; one ounce of the dried leaves infused in a quart of water may be taken daily in doses of from two to four ounces every hour or two. It may be advantageously combined with Peruvian bark; and although it may sometimes fail of producing the desired effect, I think it well deserves a station among the articles of the Materia Medica."

Ferrum. *Iron.*

A metal very abundant in nature, of a bluish gray colour, highly ductile, scarcely fusible, but easily oxidated in atmospheric air, and subject to rust. It seems even to be a constituent of organic substances, and is the only metal, which, when taken into the stomach, exerts no deleterious action upon it.

The general virtues of this metal, and the several preparations of it, are, to constringe the fibres, to quicken the circulation, to promote the deficient secretions in the remoter parts, and at the same time to repress inordinate discharges into the intestinal tube. After the use of them, if they take effect, the pulse is very sensibly raised; the colour of the face, though before pale, changes to a florid red; the alvine, urinary, and cuticular excretions, are increased. Fetid eructations, and the feces voided of a black colour, are marks of their taking due effect.

When given improperly or to excess, iron produces headach, anxiety; heats the body and often causes hæmorrhagies, or even vomiting, pains in the stomach, and spasms and pains of the bowels.

Iron is given in most cases of debility and relaxation,

1. In passive hæmorrhagies.
2. In dyspepsia, hysteria, and chlorosis.
3. In most of the cachexiæ.
4. In general debility produced by disease, or excessive hæmorrhagy.

When either a preternatural discharge, or suppression of natural secretions, proceed from a languor and sluggishness of the fluids, and weakness of the solids: this metal, by increasing the motion of the former, and the strength of the latter, will suppress the flux, or remove

the suppression; but where the circulation is already too quick, the solids too tense and rigid, where there is any stricture or spasmodic contraction of the vessels, iron, and all the preparations of it, will aggravate both distempers.

Soft malleable iron is the only kind fit for internal use, as steel and cast-iron always contain impurities, and often arsenic: as its mechanical division is extremely difficult, it is directed to be kept in the shops in the state of filings or wire.

FERRI OXIDUM NIGRUM. *The black oxide of iron, such as are the scales of iron, formed at the foot of the blacksmith's anvil.*

When iron is heated to redness in the smith's forge, to render it more malleable, its surface becomes oxidized by the action of the atmospheric air; and as the oxide formed does not adhere to the iron, it is easily separated by percussion on the anvil, and flies off in the state of sparks, which, on cooling, constitute the scales of iron. In these, the iron is oxidized to that degree in which it is soluble in acids, without the production of hydrogen gas: therefore, when taken into the stomach, they do not produce the distention and flatulence occasioned by the use of the filings. These scales are purified for use by the application of the magnet. For the magnet will attract only the smaller and purer scales, and will leave those which are larger and less pure.

FERULA ASSA FOETIDA. *Assa fœtida.* The gum resin.

The plant which furnishes assa fœtida is perennial and a native of Persia. It has, however, borne fertile seeds in the open air, in the botanical garden of Edinburgh. The gum resin is procured from the roots of plants which are at least four years old. The top of the root is cut off transversely, and the juice suffered to exude, which is afterwards exposed to the heat of the sun to harden. It comes to us in large irregular masses, composed of various little shining lumps or grains, which are partly of a whitish colour, partly reddish, and partly of a violet hue. Those masses are accounted the best, which are clear, of a pale reddish colour, and variegated with a great number of elegant white tears. This drug has a strong fœtid

smell, somewhat like that of garlic; and a bitter, acrid, biting taste. It loses some of its smell and strength by keeping; a circumstance to be particularly regarded in its exhibition. It is the most powerful of all the fœtid gums, and is a most valuable remedy. It acts as a stimulant, antispasmodic, expectorant, emmenagogue, and anthelmintic. Its action is quick and penetrating, and it affords great and speedy relief in spasmodic, flatulent, hysteric, and hypochondriacal complaints, especially when they arise from obstructions of the bowels. Where spasms and constipations have weakened the powers of nature, and the functions are in a languid state, it generally affords effectual relief; as it promotes digestion, enlivens the animal spirits, and by increasing the peristaltic motion of the intestines, tends to open them in persons of an advanced age. In the spasmodic, as well as humoral asthma, unattended with fever, it is an excellent remedy; for, in the former, it counteracts the strictures of the respiring organs, and in the latter, greatly facilitates expectoration. The hooping cough has been cured, and worms have frequently been expelled, by the conjoined administration of assa fœtida, both by the mouth and in the form of clyster. It is exhibited in the form of pills, in doses of from five to twenty grains, either alone, or combined with bitter extracts or purgatives; or it may be given in tincture, or dissolved in some simple distilled water. In the form of clyster, it is frequently directed to the extent of two drachms, dissolved in eight ounces of water as an antispasmodic.

Ficus Carica. *The fig tree.* The fruit.

This tree is probably a native of Asia, but grows plentifully in the south of Europe. As the fruit is very pulpy, it is dried when it is to be preserved. They consist almost entirely of sugar and mucilage, and are therefore demulcent. They are grateful to the stomach, and more easy of digestion than any other sweet fruit, and abounding in saccharine matter, they are very nutritious, but apt to occasion flatulency, when eaten without bread, or other mealy substances. A decoction of figs affords excellent gargles to cleanse the throat and mouth. This fruit also forms an ingredient in lenitive electuaries, and pectoral draughts, and is likewise applied externally to soften, digest, and promote maturation.

Figs ripen very well by the middle of September in Philadelphia, when enjoying a free exposure to the sun. In the southern states they flourish luxuriantly, and might become an article of extensive exportation, and home consumption, if pains were taken to introduce the large Levant fig.

FRASERA CAROLINENSIS, *Walth.* } *Columbo of Marietta.*
FRASERA WALTHERI, *Mich.* } The root.

This species of columbo is produced in the vicinity of Marietta in Ohio, and we are indebted to Dr. S. P. Hildreth of that place for a partial description of the plant. According to him the Columba Americana is a regular and very elegantly proportioned plant, growing to the height of seven feet.

It is a production of high land, a rich and loamy soil that is covered with white oak, white thorn, and tufts of prairie grass. The stalk is covered with a smooth delicate membrane of a deep purple colour at the root, but becoming lighter as it ascends toward the top. Beneath this is a pulpy coat, fibrous and vascular, which covers another that is entirely ligneous which is the chief support of the stalk. The remainder is medullary, and completely fills the woody circle. The Columbo of Marietta is a triennial plant. The radical leaves, when it springs from the seed, are five in number, to these are added the second season five more. The third spring it sends up a stalk with five whorls of leaves, when each whorl consists of *five leaves,* and *four,* when each whorl consists of *four,* before it puts out any flowering branches. The leaves are in whorls smooth and spear shaped. The branches are axillary, upright, and of the same number with the leaves, from the basis of which they immediately rise and send out opposite fruit stalks. From the whorls where the flowering branches commence to the top of the stalk, if it consists of five leaves, there are ten whorls growing gradually less to the apex, which ends with five peduncles. It flowers in July. The root as soon as it enters the earth shoots out in a horizontal direction; is spindle shaped; and when well grown is from eighteen to thirty inches in length, and two in diameter at the turn. Near the surface of the earth the root is wrinkled; its colour in the young plant is a light yellow; and is solid and brittle. After the stalk is grown the root be-

comes softer and less bitter. The proper time for collecting it seems to be in the spring of the third year. Dr. Hildreth asserts that from the experiments he has made with American columbo, he is induced to believe it fully equal, if not superior to the imported. It is in common use there, and has in one instance, in the heat of summer, put a stop to a wide spreading gangrene, on one of the lower extremities, by internal use and external application, when bark and other remedies had failed.

The columbo plant is undoubtedly to be estimated as a valuable acquisition to our Materia Medica. The root, however, is found on examination to be of a lighter colour, and to possess less of the bitter principle than the imported root; its comparative efficacy is therefore doubtful, and yet to be ascertained.

FRAXINUS ORNUS. *Manna Ash.* The concrete juice, called manna.

Manna is obtained from other species of fraxinus besides the ornus, and especially from the rotundifolia. It is principally collected in Calabria and Sicily. In the warmest season of the year, from the middle of June to the end of July, a clear juice exudes from the stem and branches of these trees, which, when naturally concreted on the plants and scraped off, is called manna. The best Calabrian manna is imported in oblong, light, friable flakes, or pieces of a whitish or pale yellow shade, and somewhat transparent. The inferior sorts are moist, unctuous, and of a darker colour.

Manna is a mild and agreeable laxative, which may be safely administered to children and the aged, though in some constitutions it is apt to induce flatulence, and to distend the bowels; but this inconvenience may be remedied by the addition of a little cinnamon water, or other warm aromatic. The dose for children is according to their age, from one to three drachms, and for adults, one ounce, or one ounce and an half; as, however, its operation when by itself, is very mild, and sometimes imperceptible, it is generally given in laxative mineral waters, or combined with salts, senna, rhubarb, or similar aperient medicines.

Manna is also one of the most useful demulcents in the humid asthma, and similar pituitous as well as inflammatory affections of the breast; it also beneficially promotes

expectoration, and is of peculiar service in the second stage of the small pox, or during the suppuration of the pustules.

Gambogia. *Gamboge.* A gum resin.

A concrete vegetable juice, of a gummy, resinous nature. It issues from the cambogia gutta, a native of Cambia in the East Indies; whence it is imported in large cakes or rolls. The best sort is of a deep yellow colour; is divested of all smell, and has very little taste. When taken as a medicine it operates violently, both upwards and downwards. It has been used in dropsies with cream of tartar, or jalap, or with both, to accelerate their operation; but calomel has been found to be a useful addition to gamboge in dropsical cases. Gamboge is also recommended to be taken for the expulsion of the tape-worm, in doses of fifteen grains, early in the morning, and, if the worm be not expelled in two or three hours, this powerful dose is said to have been repeated with safety and success, even to the third time, and in persons of delicate habits. Great precaution, however, is requisite in the use of this precarious and active medicine; and, if accidentally, too large a dose of it should be swallowed, the most effectual antidote will be copious draughts of a solution of pearl ashes in water.

Gentiana Lutea. *Gentian.* The root.

Gentian is a perennial plant which grows upon the Alps, Pyrennees, and other mountainous parts of Europe. The roots are long and thick, externally of a brown colour, and wrinkled; internally spongy, and of a yellow colour, without any remarkable smell, but surpassing all other European vegetables in bitterness. Alcohol dissolves only the bitter extractive; water, both the extractive and mucilage. Gentian possesses the general virtues of bitters in an eminent degree, and is wholly devoid of astringency. Taken into the stomach, it proves a powerful tonic, and in large doses, it evacuates the intestines. It is useful in debility of the stomach, in general debility, and in gout: combined with astringents, it cures intermittents. The dose of this drug in powder, is from ten to forty grains; though it is more frequently taken as the

chief ingredient in bitter wines, tinctures, and infusions. There are several species of Gentian in the United States. Dr. Shoepf particularly praises a low species with narrow leaves which he found in the glades in Pennsylvania.

GEOFFRÆA INERMIS. *Cabbage bark tree.* The bark.

The bark of this tree, which grows in Jamaica, is of a gray colour externally, but black, and furrowed on the inside. The powder resembles jalap, but is not so heavy. It has a mucilaginous and sweetish taste, and a disagreeable smell. Its medical effects are much greater than its sensible qualities would lead us to expect. It is given in cases of worms in form of powder, decoction, syrup, and extract. The decoction is preferable, and is made by slowly boiling an ounce of the fresh dried bark, in a quart of water, till it assume the colour of Madeira wine. This sweetened, is the syrup; evaporated, it forms an extract. It commonly produces some sickness and purging; sometimes more violent effects, as vomiting, delirium, and fever. These last are said to be owing to an over dose, or to drinking cold water; and are relieved by warm water, castor oil, or a vegetable acid. It should always be given at first in small doses; and, when properly and cautiously administered, it operates as a very powerful anthelmintic, particularly for the expulsion of the lumbrici, which are a very common cause of disease in the West India islands, and there it is very frequently employed, with singular success.

GERANIUM MACULATUM, or *Cranes Bill.* The plant and roots.

This is a common plant near Philadelphia, and in many other parts of the United States. It is commonly known by the English name of "*Crowfoot*," and flowers in the spring. It is a powerful astringent, and will stop very violent bleedings, if applied to the wounded vessel. A decoction of this plant has also, on some trials, manifested great efficacy in restraining internal hæmorrhagy. The root boiled in milk is a common domestic remedy for the bowel complaints of children.

GEUM URBANUM. *Common Avens, or Herb-bennet.* The root.

This plant grows by fences and borders of fields, the blossoms are white or yellowish in July. According to Dr. Willich the root of avens has lately been employed in Europe with singular efficacy in the cure of obstinate agues. A strong tincture of the root given to the quantity of half an ounce, or the decoction, or powder, in doses of one drachm several times in a day, has seldom failed to cure intermittents, where the Peruvian bark had proved ineffectual. The root has also afforded an excellent remedy in several chronic disorders, as a general strengthener and astringent, and its antiseptic power is said to be superior to the best Peruvian bark. Dr. Withering says the roots gathered in the spring and put into beer give it a pleasant flavour and prevent its growing sour. Infused in wine it is a good stomachic, says Dr. Cutler. When it grows in warm dry situations, its taste is mildly austere and aromatic.

Dr. Cutler describes also another variety. *Water Avens.* Throat root. Cureall.

The blossoms are purplish. In boggy meadows. May. The root is powerfully astringent. A decoction of it has been used, with good success, as a gargle, and a drink, in inflamed and ulcerated sore throats, and cankers. It is said, that the powdered root will cure tertian agues, and that it is much used by the Canadians for that purpose.

GLYCYRRHIZA GLABRA. *Liquorice.* The root and extract.

Liquorice is a perennial plant, and a native of the south of Europe, but is cultivated in considerable quantities in England, for medicinal purposes. The root of this plant has a sweet agreeable taste. This sweetness is extracted by water, by infusion or decoction; and, by evaporation, a dark coloured extract, of the same sweet taste, is obtained, consisting principally of saccharine and mucilaginous matter. Liquorice root is a pleasant demulcent, which is frequently added to infusions of linseed or althæa.

There is no doubt of its gentle deterging qualities, which render it an excellent medicine in coughs, hoarseness, asthma, &c. for lubricating the throat, softening

acrimonious humours, and affording relief to the organs of respiration. But with this intention it ought to be taken as a diet drink in considerable portions by way of infusion. This plant is found in the state of Vermont, and on the borders of the Ohio river.

GUAJACUM OFFICINALE. *Officinal Guaiacum.* The wood and resin.

Guaiacum, or lignum vitæ, is a genus of plants producing three species, the principal of which is the officinale, or common lignum vitæ, a native of the West Indies. The wood of this tree, and the gum resin obtained by exudation from incisions in its trunk, are the parts of it used in medicine.

The wood is hard and heavy, of a yellow colour, has little smell, and a moderately bitter taste. Its virtues depend on the small portion of resinous matter which it contains.

Gum guaiacum is of a friable nature, of a deep greenish colour, and sometimes of a reddish hue, and has a pungent acrid taste.*

This medicine was introduced into practice as a remedy in the treatment of lues venerea, and was at one time considered capable of effecting a radical cure. Its powers are now better ascertained. It is employed, and with some advantage, in promoting the action of mercury in the confirmed state of the disease, and in alleviating the various symptoms which arise from a protracted mercurial course. The general virtues of guaiacum, are those of a warm aromatic medicine; it strengthens the stomach and other viscera, and greatly promotes the discharge of urine and perspiration. Hence it is of especial service in cutaneous eruptions, and disorders arising from obstructions of the excretory glands; in rheumatic, and other pains, unattended with fever, the liberal use of gum guaiacum has often afforded considerable relief. It is likewise a good laxative, and furnishes a more active medicine than either the wood or bark of this tree. This gum when dissolved in rum, or combined with water, by

* Guaiacum is a stimulating medicine, proving diaphoretic in a dose of about half a drachm, and purgative in a larger dose. Its sudorific powers is promoted by opium, or the preparations of antimony.

means of mucilage or the yolk of an egg, or in the form of tincture and elixir, has been found useful in chronic rheumatism, or even in such wandering pains of the stomach and other parts of the body, as could be attributed to the retrocedent gout.

The form in which guaiac wood is administered, is always that of decoction. A quart of it is drunk in the course of the day. If taken warm, it produces diaphoresis.

HAMAMELIS VIRGINIANA. *Witch-hazel.* The bark.

This tree is a native of the United States. The leaves are nearly inversely ovate. Blossoms, yellow: stand three or four together on short flower stalks. In loamy land. Blossoms, September and October. This singular shrub does not commonly bloom until its leaves are destroyed by frost, when its numerous blossoms make a gay and agreeable appearance; and continue until the weather becomes very cold, often until snow falls. The germen endures the severity of our winters uninjured; for the fruit does not ripen until the next September, the time of its blossoming again, when ripe fruit and blossoms will be found on the same tree. The Indians considered this tree as a valuable article in their *Materia Medica.* They applied the bark, which is sedative and discutient, to painful tumors and external inflammations. A cataplasm of the inner rind of the bark, is found to be very efficacious in removing painful inflammations of the eyes. The bark chewed in the mouth is, at first, somewhat bitter, very sensibly astringent, and then leaves a pungent, sweetish taste, which will remain for a considerable time. The specific qualities of this tree seem, by no means to be accurately ascertained. It is probably possessed of very valuable properties. *Cutler.*

Mr. Bartram informs, that this shrub grows ten or twelve feet high, from one common root.

HÆMATOXYLUM CAMPECHIANUM. *Logwood Tree.* The wood.

This tree was introduced from Honduras into Jamaica, where it is now very common. Logwood is of a deep red colour; has scarcely any smell; its taste is sweetish, and

astringent. It is used principally as a dye-wood, and also with considerable advantage in medicine. Its active matter is extracted by water, and by alcohol; both solutions strike a black colour with the salt of iron.

It has been employed in medicine as an astringent in diarrhœa, and chronic dysentery, under the form of decoction, or watery extract.

HELLEBORUS NIGER. *Black Hellebore.* The root.

This plant is perennial, and grows wild in the mountainous parts of Austria, and the Pyrennees. The root of this plant consists of small fibres attached to one head; externally dark coloured, internally white. Its taste is very acrid, but the acrimony is much impaired by drying and keeping.

Its medicinal power seems principally to depend on its resinous part. By decoction with water, it yields half its weight of gummy matter, with some resin; the extract obtained by inspissation is milder than the root itself.

Black hellebore root is a very violent cathartic, in a dose from ten to twenty grains; so violent, indeed, that it is seldom used. On its cathartic power probably depends any advantage that may be derived from its administration in mania and melancholia, in which diseases it was highly celebrated by the ancients. In dropsy it has been employed as an hydragogue cathartic. It was likewise strongly recommended by Mead as an emmenagogue, though with others it has seldom been successful.

HELLEBORUS FŒTIDUS. *Bears Foot. Setterwort.* The leaves.

This species is found in meadows, shady places, and under hedges, and is also perennial. The stalk is about three feet high. The leaves are of a deep green, bird-footed. All of them grow on the stem, none towards the root. It produces numerous green flowers, somewhat tinged with purple at the edges, which blow in April and May. The leaves have an acrid, bitter, nauseous taste, and an unpleasant smell, especially when they are fresh. When dried, they are frequently given as a domestic medicine to destroy worms; but they must be used with great caution, being so violent in their operation, that

instances of their fatal effects are recorded. Since we are not destitute of safe and efficacious anthelmintics, this dangerous remedy should be rejected.

Heracleum Sphondylium. *Common Cow Parsnip.*

This article was brought into notice by the late Dr. Joseph Orne, of Salem. In a communication to the Massachusetts Medical Society, October, 1803, he thus describes it: Common Cow Parsnip. (*Sphondylium vulgare hirsutum. Park. C. B.*) It grows in hedges; the stalk is large and tubular, invested with a down which also covers the leaves, that are large and jagged, five on each stalk, and of the colour of wormwood; it is umbelliferous, and flowers in June; the root is divided into several long and fibrous branches, resembling a large parsley root; and the height of the plant, in its maturity, may be from two to four feet: the root has a rank strong smell, and a pungent and almost caustic taste; it should be carefully distinguished from the common parsnip, that grows wild in gardens, and hedges; and indeed, it has a very different appearance.

The particular disease in which Dr. Orne commends the Cow Parsnip, is that of epilepsy. Three of the five cases which are exhibited in his communication, were cured by the use of this medicine. The author judiciously observes, that in the three successful cases, the patients were remarkably liable to flatulence, with symptoms of morbid sensibility of the stomach, and date their first relief from the sensation of a more firm and healthful tone of that organ, and the carminative effects of the medicine. He commonly prescribed two or three drachms of the pulverized root, to be taken every day for a great length of time, and a strong infusion of the leaves and tops to be drunk at bed time.

In the hands of other practitioners, this plant has manifested considerable efficacy, exerting its peculiar powers immediately on the stomach, as an excellent carminative, and, if it does not cure epilepsy, it generally mitigates the distressing symptoms attending that disease. In some cases of dyspepsia, accompanied with flatulencies and cardialgia, a strong decoction of this plant has been given by Dr. Mann with satisfactory success.

Hirudo Medicinalis. *The Leech.*

That species of leech which is used in medicine has a flat and slimy body, composed of rings tapering towards the head which is turbinated, commonly about two or three inches long, and of the thickness of a goose quill, but capable of elongating or contracting itself very much. Its back is of a dull olive green colour, divided into three nearly equal parts by four yellow longitudinal lines, the two lateral entire, the two central broken with black. Besides these, between the lateral and central lines on each side, there are two others resembling a chain of black and yellow. The belly is turkey blue, irregularly marked with yellow spots. It attaches itself to solid substances by either end, being furnished with a circular sucker at the anal extremity, and a horse shoe one at the head, with a triangular mouth in the centre.

They should be collected in summer in water having a clear sandy bottom, as the bite of those found in stagnant waters and marshes is said to cause pain and inflammation. For the same reason the horse leech which is entirely brown, or only marked with a marginal yellow line is commonly rejected.

Leeches are best preserved for use, in a bottle half filled with pure spring or river water, and covered with gauze or muslin. It is adviseable frequently to change the water in which they are kept, although there are instances of their living many months and even years in the same water, and it is remarkable water in which they are, keeps much longer sweet than by itself. They should always be kept in a moderate temperature about 50° Fahr. When leeches have gorged themselves with blood, they frequently die of indigestion, and cause a great mortality even among those who have not been used. To avoid this danger, leeches which have recently sucked should be kept by themselves until they have recovered their usual vigour; and a little salt applied to the head of the animal will occasion it to vomit up the blood which it has received. Leeches change their skin frequently; at that time they are subject to indisposition and will not bite.

Leeches are very useful and convenient remedies in every case requiring local blood-letting.—They cause less irritation than cupping, and can often be applied nearer

to the part. They are employed in inflammations of all kinds, as opthalmia, phrenitis, cynanche, rheumatism, odontalgia, and podagra. In some cases of rubeola and scarlatina, in hæmorrhois, in plethora of the head, mania, dysuria and chincough.

The application of leeches is sometimes attended with difficulty. In cloudy weather and in the evening they do not readily bite. If kept out of the water some minutes before they are applied and allowed to crawl on dry linen they are said to bite more eagerly. The part to which they are to be applied should be well washed; first with soap and water and afterwards with water, or milk and water, and if covered with strong hairs, should be shaved. When they are not inclined to bite, the part may be moistened with milk, or a little blood drawn by a scratch with a lancet. A large leech will draw about an ounce of blood; but the quantity may be much increased by bathing the wounds with tepid water or applying over them cupping glasses. Sometimes it is difficult to stop the bleeding; but it will always cease on applying a little lint and continuing pressure a sufficient length of time.

HORDEUM DISTICHON. *Barley.* The seed stripped of its husk, called pearl barley.

Barley has from the earliest ages been considered as a wholesome and nutritious food. Pearl barley is prepared by grinding off the husk of rough barley, and forming the grain into little round granules, which appear of a kind of pearl whiteness. In this state, barley consists almost entirely of amylaceous matter, and when boiled forms an excellent article of nourishment. In diseases of the kidneys and the breast, as well as in that state of the body where it is said to abound in acrimonious humors, decoctions made of this grain, sufficiently strong, and acidulated with vinegar, are eminently useful. As a cooling and diluent beverage, barley water is of essential service to febrile patients, and in all inflammatory cases, where preternatural heat and thirst prevail; but, to promote its salutary effects, the grosser parts which remain after decoction, ought not to be swallowed.

HUMULUS LUPULUS. *The common hop.* The flowers.

This perennial plant is a very strong bitter accompanied with a degree of aromatic flavour and some astringency;

these are extracted by water by infusion; by decoction the aromatic flavour is lost. Along with its bitterness it has a narcotic power: of this the popular remedy, sometimes successful, of a pillow of hops to procure sleep in the delirium of fever and in mania, is a proof. It accordingly, when given internally in a full dose, reduces the frequency of the pulse and procures sleep. It has been employed as an anodyne, either in substance, in the dose of three grains, or under the form of infusion or tincture. A cataplasm or ointment, prepared from it, has been also used as an anodyne application to cancerous sores.

HYDRARGYRUM. *Argentum Vivum. Mercury or Quicksilver.*

Mercury is sometimes found in a native state in the bowels of the earth. The most celebrated mines which produce it are those of Idria, Hungary, Bohemia and Carinthia; those of Montpellier in France, of Normandy, of Spain, and those of Peru. This metal is peculiarly distinguished by its fluidity in all natural temperatures, with the exception of the intense cold that sometimes prevails in very northern regions. Its congealing point is 40° of Fahrenheit. In its liquid state, it has the perfect opacity and lustre characteristic of metals, and likewise the property of great density, its specific gravity being to that of water as 13.5 to 1 nearly: it boils at a temperature a little above 600°, and when boiling suffers oxidation from the action of the atmospheric air. It is oxidated even at natural temperatures, when subjected to agitation; or still more easily when triturated with any viscid matter, which is interposed between its globules, extending their surface. Quicksilver is usually obtained from the ore in which it is combined with sulphur, this being submitted to heat mixed with iron or lime, either of which combines with the sulphur, and the mercury is obtained by distillation. The quicksilver of commerce is sometimes impure, or adulterated by the intermixture of other metals, particularly lead and bismuth. This may be suspected when the metal loses its lustre speedily, and is covered with a gray film, or from its diminished mobility in consequence of which its globules do not preserve exactly the spherical form, nor unite easily with each other: and it may be discovered, with more certainty, by

exposing it to a heat sufficient to volatilize the quicksilver, when any other metal present will remain. It is best purified by distillation from iron filings in an iron retort. Next to gold and platina, mercury is the heaviest of all the metals, with most of which it unites, excepting iron and antimony. Mercury taken into the stomach, in its metallic state, has no action on the body, except what arises from its weight or bulk. It is not poisonous, as was vulgarly supposed, but perfectly inert. There is nevertheless indubitable evidence that persons who work in the mines, or are otherwise exposed to the fumes of quicksilver, frequently experience its destructive consequences. Among other diseases arising from this cause, Hoffman mentions palsies, apoplexies, epilepsies, hectic fever, &c. These remarks are corroborated by a recent occurrence which took place on board two vessels in which, from the fumes of quicksilver, an alarming illness broke out among the crews, all of whom were more or less salivated.

With regard to the medical history of mercury as recorded by a late writer* no mention is made of it in the writings of Hippocrates, though Aristotle and his contemporaries were not unacquainted with it. Dioscorides, Pliny, and even Galen, considered it as highly corrosive, and classed it among the poisons. Avicenna was among the foremost who, influenced by the practice of some distinguished Arabian physicians, become reconciled to the opinion of its salutary tendency. In the year 1497 this metal was introduced as a sovereign remedy in lues venerea, and after a warm contention relative to its use, between the chemists and Galenists, it was received as one of the most valuable articles of the Materia Medica. Among the various substances with which we are acquainted in medicine, the preparations of mercury, as respects their operation on our system, is incomparably the most important, nor have their properties, perhaps, undergone investigation commensurate with their wonderful powers and extensive utility. According to Mr. Murray, a late and truly scientific writer on Materia Me-

* Dr. John W. Frances, of New-York, in an inaugural dissertation on mercury, has presented a new view of the natural and medical history, and curative action of that metal. His production, couched in perspicuous and elegant language, evinces ability, and extensive research relative to a subject of high importance to medical science, and has strong claims to the attention of the physicians of the United States.

dica, mercury is placed in the class of tonics, viewing its tonic power as its primary operation. Its power of exciting the salivary discharge is merely a secondary effect, not constant nor uniform, and which is not essential in any disease. It is the most general stimulant belonging to the Materia Medica, pervading every part of the system; acting, as Cullen has remarked, as a stimulus to every sensible and moving fibre of the body, and producing the most permanent effects. Hence it is the most general evacuant we possess; and from its stimulant operation, exerted directly or indirectly, we are able to explain its utility in many diseases. When rendered active on the system, by any of the modes of preparation to which it is subjected, it is received into the blood, and enabled to act on every part of the system. Hence, when given in moderate quantity, it communicates general vigour; it increases the force of the circulation when this has been languid; by the increased vascular action which it excites, it gives to the blood the disposition to assume the buffy coat; and by its stimulant operation on secreting organs, it promotes the secretions, and hence is the most general evacuant we have. On its stimulant operation probably depends its efficacy in diseases connected with spasmodic action, as tetanus and hydrophobia; and perhaps also that derived from it in various forms of fever, particularly the remitting fever of warm climates, and yellow fever; and its local operation is distinctly marked in the advantage derived from it in chronic hepatitis, and other varieties of visceral and glandular obstructions, and in the the different species of cutaneous eruptions. It is frequently employed, and with the utmost advantage, in inflammatory diseases and in dysentery; in cachectic diseases, as the various species of dropsical affections, and in many chronic morbid states of the system.

Its most important medicinal operation, however, is that displayed in removing the disease induced by the syphilitic poison. In this, its power is nearly, if not altogether specific, no article of the Materia Medica could be substituted for it; and then may be affirmed of it, what cannot with equal justice be said of any remedy employed in the treatment of any other morbid affection, that if duly administered, it will scarcely ever fail in effecting a cure. It is difficult to assign any satisfactory theory of its operation. Its efficacy has been ascribed to its general evacuant power, in consequence of which

the syphilitic virus is discharged from the body. But the speedy disappearance of the local symptoms of syphilis under its use, affords a proof that it operates on some other principle; no similar advantage is derived from other evacuants; and its efficacy is not proportional to the evacuation it excites, but is frequently displayed where this is altogether insensible. The opinion has been advanced, that it acts as an antidote to the venereal virus, neutralizing it somewhat in the manner in which one chemical agent subdues the properties of another,—an opinion extremely vague and hypothetical, and rendered improbable from the consideration of the very small quantity of some of the more active preparations of mercury, from which a cure may be obtained, compared with the large quantity of others less active, that requires to be administered.

The explanation advanced by Mr. Hunter, that the efficacy of mercury in the treatment of syphilis depends on its general and permanent stimulant operation on the system, by which it induces and keeps up an action incompatible with that morbid action which constitutes the disease, until the virus is destroyed by the chemical changes going on in the system, or until it is eliminated from the body by the usual excretion, is on the whole most probable: it rests on a principle undoubted, that there are states of morbid action incompatible, so that one suspends the action of the other; and mercury does exert a very general action, inducing and keeping up what may be regarded as a morbid state.

The mode of administering mercury, for the cure of the venereal disease, under all its forms, is now ascertained with sufficient precision. There is no advantage in giving it so as to induce profuse salivation; this is even to be avoided as hurtful; at the same time, it is proper that salivation should be excited to a certain extent, not probably as essential to its efficacy, but as a proof of its full action on the system being obtained. This is kept up for a certain time, longer or shorter, according to the state of the symptoms, and the previous continuance of the disease. Exposure to cold is avoided, as being liable to cause the more partial operation of mercury on the salivary glands; and the state of irritation is diminished, or determination to the intestines producing purging is obviated, by the exhibition of an opiate. When profuse salivation occurs, the remedies employed to check it are cathartics in moderate doses, small doses of opium, the

application of a blister to the throat, and the administration of sulphuret of potash; the last being employed from the doubtful hypothesis, that its chemical agency may neutralize the mercury. Free exposure to a cool air is, according to Mr. Pearson, more effectual than any other method. Peruvian bark, mineral acids, and the assiduous application of astringent gargles have their use, while the employment of mercury must be discontinued for a time. On the other hand, the sudden suppression of ptyalism is not without danger. It is most frequently caused by cold liquids being taken into the stomach, or exposure to cold and moisture, while under the influence of mercury.

Sometimes also a morbid condition of the system occurs during a mercurial course, and which tends to a fatal issue. Mr. Pearson has termed it erethismus. It is characterized by a great depression of strength; a sense of anxiety about the præcordia; frequent sighing; trembling, partial or universal; a small, quick pulse, sometimes vomiting; a pale contracted countenance; a sense of coldness, while the tongue is seldom furred, or the vital or natural functions much disordered. In this state, a violent or sudden exertion of muscular power, will sometimes prove fatal.

To prevent dangerous consequences the administration of mercury must be immediately suspended, and the patient exposed to a dry, cool air, in such a manner as shall be attended with the least fatigue. An incipient erethismus has often been averted or cured by large doses of the volatile alkali, and by the camphor mixture.

Dr. Frances expresses an opinion that the modus operandi of mercury remains a question far from being decided. He adopts the opinion, however, that in a state of an oxide it is one of the most universal stimulants, acting on the nervous system, producing restlessness, anxiety, and debility. On the sanguiferous system, disposing the blood to take on the buffy coat, rendering the pulse frequent and harder, increasing respiration and occasioning other symptoms of inflammatory action. It affects the secretions, inducing a preternatural flow of saliva, an increased action of the mucous vessels of the trachea, lungs, digestive organs, chylopoietic viscera and whole intestinal canal. It excites a copious discharge of urine, and in the smallest quantity operates with great certainty on the skin and produces increased action of the

absorbent vessels. It is therefore on its very general and stimulant operation in promoting the *excretions of the whole system*, depends its curative action. For the same salutary effects will not be produced when its action is not thus extensive, as when confined to the salivary glands or exerts its influence on the intestinal canal alone.

For more than half a century the mercurial practice in the treatment of inflammatory and other febrile diseases, has been prevalent among some physicians in New-England; and in pneumonia, pleurisies, acute rheumatisms, and other phlegmasiæ, it has been considered a remedy of superior efficacy. About the year 1735 a malignant ulcerous sore throat became epidemical in the vicinity of Boston, and New-York, &c. which having baffled the skill of physicians, at length yielded in a surprising manner to the administration of calomel. Subsequently to this event, the employment of mercury has been extended to the various forms of malignant, pestilential, or yellow fever of the West Indies, and to the intermitting, remitting, and typhus fevers which have ravaged some of the cities of the United States. Various opinions and much controversy have subsisted in the medical world respecting this subject. Dr. F. has now given to it a zealous investigation. To Dr. Chisholm he ascribes exclusively the credit of being the first who adopted the novel practice of exhibiting mercury to the full extent; having given calomel to the amount of four hundred grains, and at a subsequent season no less than eight hundred, and at other times upwards of one thousand grains were employed. Nay farther! in one instance of yellow remitting fever, before any very material change took place in the state of the patient, he had taken, says Dr. C. sixty-four grains of calomel by the mouth, thirty-four drachms by clyster, and sixteen ounces of the strongest mercurial ointment carefully rubbed into his arms and thighs; in all five thousand seven hundred and four grains in the course of five days. His recovery was astonishingly rapid after the change was effected.

If it be conceded that the mercurial practice to a greater or less extent in the hands of Dr. Chisholm, Dr. Wright, and other eminently distinguished physicians in the West Indies, was crowned with success, exceeding that of any other method, yet the utility of a similar mode of treatment in the diseases of the same type in the United States, is deemed problematical. This more appropriate point

receives an able discussion by our author. The climate of this country, he says, is singularly unfavorable to the salutary operation of this medicine. While the liver appears to be the most diseased organ in those who die of yellow fever in the West Indies, this important viscus seems to be in a remarkable degree exempt from derangement, in the same disease in our country, as proved by numerous dissections. The very nature and seat of the disease establish the fact, that, the brain and nervous system are primarily affected, the stomach and duodenum exhibit marks of high inflammation, and approaching sphacelus, attended by acute pain in the gastric region, and extreme irritability of the stomach. These symptoms, instead of being removed by the use of calomel, are greatly aggravated, and excessive vomiting is induced, which terminates but with the life of the patient.

In the more advanced stage of yellow fever, when the most formidable symptoms have occurred, the great prostration of strength forbids the recourse to a medicine of such debilitating powers; the rapid termination sets at defiance the slow accomplishment of salivation. Whether therefore, with a view of its action on the salivary glands or otherwise, the indiscriminate employment of mercury in the treatment of yellow fever, or the various forms of intermitting or remitting fever of our country, is according to Dr. F. to be considered as an abuse of the medicine, and altogether inadmissible.

With regard to the employment of mercury as a remedy in syphilis, Dr. F. accords in opinion with other writers as to its almost infallible powers; with much propriety however, he animadverts on the maladministration of it, as producing more destructive consequences than the disease itself. He is most decidedly opposed to the popular method of treatment by a profuse salivation, induced by throwing into the system large quantities of mercury: no absurdity in medical practice having been destructive of more lives; none the source of more pain and calamity. A preternatural action from any one of the secretions is not to be depended on; mercury must be in a state of solution in the juices of the body. The specific poison of lues venerea, must be counteracted by a general operation on the constitution, or more directly in promoting the action of all the secretory vessels of the body, and especially those of the surface. Equally opposed therefore, to the opinion declared by Mr. Bell, that no advantage is

derived from any increase that may be made to any of the secretions, and to that of Mr. Howard, who is the advocate for profuse salivation even in the mildest form of the disease, and who contends that the greater the discharge the more certain the cure; the most successful practice, he observes, depends upon an increased discharge from the *excretory vessels of the whole system.*

The preparation more peculiarly adapted to effectuate these several purposes is next to be selected. The *murias hydrargyri*, or the corrosive sublimate, is in his view by far the most eligible. The qualities of this and other forms of mercury will be particularly described under the head of preparations.

It has already been observed that quicksilver taken into the stomach in its native state is perfectly inert. It has been prescribed in the first stage of the iliac passion before the bowels are too much weakened and corroded by the stagnant feces. There are instances in which several ounces, nay half a pound and upwards of pure quicksilver have been swallowed with the happiest effects, given with castor oil or fresh broth. But in the last stage of obstinate and violent colics, when inflammation and gangrene have already taken place in the bowels, its specific gravity would infallibly rend the intestines, and accelerate the fatal crisis.

The high importance of the above subject will, it is presumed, justify a reference to the opinions, and valuable observations of several writers of distinguished merit, collected into one view, and to be found in Cooper's Dictionary of Practical Surgery, under the words Mercury and Venereal disease.

HYOSCYAMUS NIGER. *Black Henbane.* The herb and seeds.

Henbane is a biennial plant, which abounds in villages, road-sides, and among rubbish, and flowers in July. The whole plant is covered with long hairs, from which exudes a clammy fœtid juice. The leaves are large and very soft; they are indented and embrace the stalk closely. The flowers come out in a very long spike, rather on one side, and sit close to the stalk. The corolla is funnel shaped and obtuse, of a pale yellowish colour, beautifully veined with purple.

The leaves of this plant, when recent, have a slightly fœtid smell; and a mucilaginous taste; when dried, they lose both taste and smell, and also part of their narcotic power. The root possesses the same qualities as the leaves, and even in a more eminent degree. Henbane, more than any other narcotic, resembles opium in its action. In a moderate dose, it increases at first the strength of the pulse, and occasions some sense of heat, which is followed by diminished sensibility and motion; in some cases by thirst, sickness, stupor, and dimness of vision. In a larger quantity it occasions profound sleep, hard pulse, and sometimes fierce delirium, ending in coma or convulsions, with a remarkable dilatation of the pupil, distortion of the countenance, a weak, tremulous pulse, and eruption of petechiæ. On dissection, gangrenous spots have been found on the internal surface of the stomach. Its baneful effects are best counteracted by a powerful emetic; and, after discharging the contents of the stomach, it will be necessary to administer emollient and oily clysters, and repeat them as often as they are ejected; and to drink as large portions of vinegar and of the juice of lemons as the stomach will support.

Henbane has been used in various spasmodic and painful diseases; as in epilepsy, hysteria, palpitation, headach, paralysis, mania, and scirrhus. It is given in the form of the inspissated juice of the fresh leaves, the dose of which is from one to two grains, which ought to be gradually increased. It is sometimes employed as a substitute for opium, where the latter, from idiosyncrasy, occasions any disagreeable symptoms. The henbane is also free from the constipating quality of the opium, and like this last also, its influence is very much diminished by habit. In open ulcers, the powder of the leaves, sprinkled on the part, has often a good effect.

Hyssopus Officinalis. *Hyssop.* The herb.

The leaves of hyssop have an aromatic smell, and a warm pungent taste; they are particularly recommended in humoral asthmas, coughs, and other disorders of the breast and lungs; being supposed wonderfully to promote expectoration. According to Ray, these leaves are of great service when applied in cataplasms to bruises, the pain of which they speedily mitigate, and at the same time disperse every mark or spot from the part affected.

INULA HELENIUM. *Elecampane.* The root.

This is a very large downy perennial plant, sometimes found wild in moist rich soils. The root, especially when dry, has an agreeable aromatic smell; its taste, on first chewing, is glutinous and somewhat rancid, quickly succeeded by an aromatic bitterness and pungency. The ancients entertained a high opinion of elecampane, which is recommended for promoting expectoration in humoral asthma and coughs; liberally taken, it is said to excite urine, and loosen the belly.

In some parts of Germany, large quantities of this root are candied, and used as a stomachic, for strengthening the tone of the viscera in general, and for attenuating viscid humors. Its dose is from twenty to sixty grains powdered; and in this form it has been found, by experience, to possess considerable efficacy.

IPECACUANHA. *Ipecacuan.* A root, either of the cephælis ipecacuanha, or psychotria emetica.

The root of ipecacuan is brought from Spanish America. It is divided into two sorts, Peruvian and Brazilian; the eye distinguishes three, ash coloured or gray, brown, and white. The ash coloured or Peruvian ipecacuan of the shops, is a small wrinkled root, bent and contorted into a great variety of figures; it has very little smell; the taste is bitterish and subacrid, covering the tongue with a kind of mucilage. The brown sort has been sometimes observed, even in a small dose, to produce violent effects. The white, though taken in a large one, has scarce any effect at all.

The first sort, the ash coloured or gray ipecacuan, is usually prefered for medicinal use. It contains both a resinous and gummy matter. It is generally stated, that its emetic power, and, indeed its principal virtues, reside in the former, though Dr. Irving has affirmed that they depend on its gum. Its active matter is completely extracted by alcohol, proof spirit, or wine. Vinegar likewise dissolves it, but at the same time greatly weakens its power. By decoction with water, its activity is greatly impaired, though the water distilled from it has scarcely any emetic power. It is even injured by

being kept long exposed, in the state of powder, to the air and light.

Ipecacuan is the mildest of those emetics, which are at the same time certain in their operation; and possesses this peculiar advantage, that, when it does not operate by vomiting, it passes off by the other emunctories. It merely evacuates the contents of the stomach, without exciting violent vomiting, or extending its action beyond the stomach; and is hence adapted to many cases where violent vomiting would be useless or improper. The medium dose of it as an emetic is fifteen grains, though twenty or thirty may be taken with perfect safety. Ipecacuan is employed with other intentions than as an emetic. It was at one time much celebrated as a remedy in dysentery, given either in such a dose as to produce full vomiting, or rather in the quantity of two or three grains, repeated every three or four hours, till it occasioned vomiting, diaphoresis, or purging. It has been given in a similar mode in obstinate diarrhœa. In spasmodic asthma, it is given in a full dose to relieve the paroxysm; and in a dose of three or four grains, continued every morning for some weeks, to prevent the return of the disease. In hæmorrhagies, it is given in nauseating doses, the nausea diminishing the force of the circulation. Combined with opium, it forms a very powerful sudorific.

The primary effect of ipecacuan, says Dr. Duncan, is that of stimulating the stomach. If the dose be sufficiently large, it excites vomiting, by inverting the peristaltic motion of the stomach and duodenum; in a smaller dose, it only produces nausea, and operates by stool; and in still smaller doses, it gently stimulates the stomach, increases the appetite, and facilitates digestion. Its secondary effects depend on the sympathy of the other parts with the stomach; and in this way only can we explain its action as an antispasmodic, diaphoretic, expectorant, and in checking hæmorrhagies.

Its beneficial effects in some cases, also, seem to be owing to the general concussion given to the whole system during the action of vomiting. It is found to increase the purgative virtue of jalap remarkably. Dr. Aiken asserts that fifteen grains of jalap, with two or three of ipecacuan, purge more than twice the quantity of jalap by itself.

Ipecacuan properly administered, often proves serviceable,

1. In intermittent fevers. It has frequently succeeded in stopping these, when given about an hour before an accession was expected, and also when given so as to produce vomiting at the time of an accession, or at the end of the cold stage.

2. In continued fevers. We have never seen more decidedly beneficial effects from the use of any medicine whatever, than from the exhibition of ipecacuan in the commencement of typhus fever. An emetic, succeeded by a diaphoretic regimen, when administered sufficiently early in this disease, very frequently cuts it short at once; and when it fails in this desirable object, it always has a beneficial influence on the progress of the fever.

3. In inflammatory diseases, rheumatism, bubo, swelled testicle.

4. In exanthematous diseases, when the eruption is disposed to recede.

5. In hæmorrhagies, when given in nauseating doses.

6. In profluvia, especially in dysentery, so much so, that it was formerly esteemed a specific against that disease. But Cullen attributes its good effects in this instance, to its producing a steady determination of the peristaltic motion of the intestines downwards, when given in repeated small doses.

7. In many spasmodic diseases; in epilepsy; asthma; dyspnæa; pertussis; chronic diarrhœa; hysteria; melancholia; mania.

8. In cachectic diseases, as in some kinds of dropsy.

9. In impetiginous diseases; in jaundice.

10. In local diseases; in amaurosis, and several of the dysorexiæ.

11. In every instance when we wish to evacuate the stomach, as when it is overloaded with food, or when poison, especially opium, has been swallowed.

The use of ipecacuan, as an emetic, is contra-indicated,

1. Where there is a disposition to hæmorrhage.

2. Where there is an increased flow of blood toward the head.

3. In very irritable subjects.

4. In pregnant women, and persons afflicted with hernia.

Ipecacuan is exhibited,

1. In substance; in powder. Full vomiting will generally be produced in an adult by a scruple or half a

drachm, and though less might answer the purpose, fortunately an over dose is scarcely attended with any inconvenience, as the whole of it is vomited with the contents of the stomach as soon as it operates. The vomiting is promoted and facilitated by drinking copiously of warm watery fluids. On the contrary, when vomiting is not intended, liquids must be rather drunk sparingly, and the dose must be diminished to a grain or less. In such small doses it is conveniently combined with any proper adjunct, in the form of powder, pill, or bolus.

2. In infusion. One drachm may be infused in four ounces of water, and taken in repeated doses till it operate.

3. Infused in wine. (See vinum ipecacuanhæ.)

Ipecacuan not only checks the narcotic effects of opium, and is therefore one of the best antidotes for its poison, but reciprocally the emetic powers of ipecacuan are checked by the addition of opium, and the combination operates by increasing the cuticular discharge. (See pulvis ipecacuanhæ et opii.)

It has recently been announced by Thomas Clark, M. D. an English physician, that a decoction of the root of ipecacuanha has been administered as injections in dysentery and internal piles with surprising success. The practice has been adopted by several physicians, all of whom testify their confidence in the superior efficacy of the remedy. Dr. Clark directs for an adult affected with dysentery three drachms of the bruised root to be boiled in a quart of water down to a pint, strained, and given all at once as a lavement, and repeated if necessary. In cases of internal piles, half that quantity will be sufficient.

IRIS PSEUDACORUS. *Water Flag. Flower de Luce. Blue Flag.* The root.

This plant is perennial, and grows in great abundance by the brinks of rivers, and in other watery places. It blossoms in July; its flowers are blue, variegated with white, yellow, and purple; its leaves sword shaped. The root has an acrid taste, and when fresh is highly cathartic. The expressed juice of the root, recently gathered, given to the quantity of sixty or eighty drops, every hour or two, and occasionally increased, has been productive of very copious evacuations, after jalap, gamboge, and other strong purgatives had proved ineffectual.

This genus of plants consists of numerous species, and of these we find many varieties in our swamps and meadows. The roots of some are much more acrid than others; and they do not in every instance lose their purgative quality by drying. Some roots in a dried state have acted as a powerful cathartic, and proved an efficacious remedy in dysentery. It must be left to the trials of experience to determine which variety possesses the most medicinal properties.

JUGLANS CINEREA. *Butternut. White Walnut.* The unripe fruit, and the inner bark.

This tree is generally known throughout the United States, and is now introduced into the Materia Medica of the Massachusetts Pharmacopœia. During the American war, the extract, made from the inner bark of this tree, attracted the attention of Dr. Rush, and other medical men in our military hospital; and, being frequently administered to patients under the operation of inoculated small pox, it was proved to be an excellent substitute for jalap or other cathartics. It is now esteemed as a valuable purgative, in doses from ten to thirty grains, not occasioning heat or irritation; and is greatly commended in cases of dysentery. Conjoined with calomel it is rendered more active and efficacious, especially in bilious habits. As this extract is often very carelessly prepared by the country people, it ought to be prepared by the apothecaries, or practitioners themselves; and as a domestic medicine of considerable importance, it should be adopted by every physician. The bark of the root of this tree will excite a blister; and the bark and shells of the nuts dye a good brown colour. A decoction of the inner bark is advantageously employed as a cathartic in the disease of horses, called the *yellow water*. The extract should be made from the bark in the month of May or June.

JUNIPERUS COMMUNIS. *Juniper.* The berries and leaves.

This is an evergreen shrub growing on dry barren commons and hilly grounds in different parts of the United States as in Europe. If planted in a good soil it will attain the height of fifteen or sixteen feet, and produce

numerous branches. It is remarkable that no grass will grow beneath this shrub. This tree has three spreading pointed leaves coming out together, that are longer than the berry. The wood is of a reddish colour, very hard and durable. Gum sandarach, more commonly called pounce, is the product of this tree. The flowers are borne upon a conical catkin, the scales of which serve the purpose of a calyx. The berries of the Juniper require two years before they ripen, when they change from a green, or a blackish purple, to a bluish black colour. Juniper berries possess a strong not disagreeable smell, and a warm pungent sweet taste, which if they be long chewed, or previously bruised, is followed by a bitterish one.

Their predominant constituents are, an essential oil, and a sweet mucilaginous matter. To the oil, they are indebted for their stimulating, carminative, diaphoretic, and diuretic properties.

They are most commonly used in the form of infusion, to which a little gin is added, as a diuretic drink in dropsy. The essential oil may be separated by distillation. It possesses the same properties in a higher degree, and imparts them to ardent spirits.

The peculiar flavour, and well-known diuretic effects of Holland gin, are owing to the oil of juniper.

Juniperus Sabina. *Savine.* The leaves.

The savine is also an evergreen shrub, spreading out much horizontally, rising but little in height. The leaves are small, opposite, running down the stalk, and rather prickly. It produces blue berries, only after it has arrived at a considerable age. The wood is internally of a beautiful reddish shade, resembling that of mahogany. The leaves of savine possess a bitter, acrid taste; and their smell is so powerful and disagreeable, that it expels moths and similar vermin. When distilled with water, these leaves yield an uncommonly large proportion of essential oil.

Savine is a warm, stimulating medicine, capable of producing diaphoresis, and increasing all the secretions, but apt to excite hæmorrhage, especially from the uterus. It has long been considered as a powerful emmenagogue, and Dr. Home asserts, that in five cases of obstructions of the menses, four were cured by the savine, which he gave in powder, from a scruple to a drachm, twice in a day.

But this acrid and heating substance, in the opinion of Dr. Cullen, is improper in plethoric habits, and should be employed with caution in those cases only which proceed from a relaxed state of the solids.

The oil distilled from this shrub is one of the most violent emmenagogues, and ought therefore to be used with the greatest caution in obstructions of the uterus or other viscera, proceeding from laxity or weakness. Savine is also recommended as an anthelmintic, and said to be very efficient in the cure of the gout.

Externally, the leaves are applied in the form of powder or infusion, to warts, carious bones, and old ulcers; and in cases of psora, gangrene, and tinea. Farriers apply this article with success to the ulcers of horses. Equal parts of powdered savine and verdegris will effectually remove warts and other excrescences from the skin, and the same preparation, when applied to issues, will greatly promote their discharge.

JUNIPERUS VIRGINIANA. *Common Red Cedar Tree.*

The leaves.

The red cedar tree is a native of the United States, and grows to the height of fifteen or twenty feet. Its berries are smaller than those of the true juniper. In Virginia and Carolina the berries are distilled into brandy. The leaves of this tree are now brought into notice by the investigation of Dr. Aaron Dexter, Professor of Chemistry, and Materia Medica, in the University at Cambridge. He has found this to be the only species of juniper in the United States, whose leaves agree in their properties with those of the savine, directed by Dr. Crowther, as the basis of the savine ointment.

KALMIA LATIFOLIA. *Broad leaved Laurel. Winter green. Callico tree.*

This is the largest of the several species of kalmia, growing to the height of seven or eight feet, in swamps and moist rocky pastures. Blossoms are white, tinged with red, in June and July. The wood is hard and compact, and the Indians are said to have made small dishes, spoons, and other utensils out of the roots; they are said also to have used a decoction of this plant to destroy themselves. The leaves are highly poisonous to horses,

but deer and pheasants eat them with impunity; though the flesh of these birds was once rendered poisonous by eating the leaves or berries late in the winter, and occasioned the death of some persons who ate of their flesh.

The other species, *kalmia angustifolia*, narrow-leaved, or dwarf laurel; called also *ivy*. *Lambkill* is an evergreen common in cold wet land. Blossoms reddish variegated. June and July. The leaves prove fatal to sheep. From an experimental inaugural dissertation published in Philadelphia in 1802, by Dr. Thomas, upon the above species of kalmia, it appears that the leaves of both abound with resin, but that the last is the most active of the two.

From the same dissertation we find, that a decoction of the K. latifolia, prepared by putting one ounce of the leaves in eight ounces of water, and boiling it down to four ounces, cured a *diarrhœa* of eight weeks continuance. The dose at first was thirty drops six times a day, but producing vertigo, it was diminished to four times a day. The itch was speedily cured by washing the parts with the decoction. The scald head, *tinea capitis*, was also cured by anointing the head with an ointment made of the leaves and hogs lard. Dr. Barton bears testimony of the efficacy of this ointment in the tinea. A saturated tincture of the leaves of this plant in proof spirit is an active remedy. Some kinds of *herpes* and warty excrescences have been known to yield to the repeated application of an infusion of kalmia leaves.

Kino: *Kino.*

The substance distinguished by this name was introduced a number of years ago into the Materia Medica as a powerful astringent, little being known with regard to its origin, farther than it was said to be the produce of Africa, and obtained probably from the plant affording it by exudation. Subsequent to its introduction, it was met with in the shops very various in its qualities: it still is so, and is obviously of different origin, though there is considerable obscurity with regard to the natural history of these varieties. The London college have described it merely as the produce of an African plant unknown. The Edinburgh college have inserted it in their catalogue of simples, as the concrete juice of the eucalyptus resinifera, a tree a native of New Holland; and there is reason to believe that at least part of what is called kino in the

shops is imported from that country, and is the produce of this vegetable. The Dublin college have considered kino, as the product of the butea frondosa, on the authority of Roxburgh; but incorrectly, as Dr. Duncan has remarked. He has farther observed, what is perfectly just, that much of the kino of the shops bears all the appearance of an extract artificially prepared, and is known to be formed from different astringent vegetables. It is not very easy to discriminate exactly among these various substances, and to assign to each its real origin. One variety, and which bears the highest price in the shops, has all the appearance of a natural production: slender twigs are intermixed in its substance; it is of a reddish brown colour, with a resinous lustre, is very brittle, and has a bitterish astringent taste. This corresponds in its characters with the substance first introduced as kino, and is still said to be the produce of Africa, and to be imported from Senegal. The kind from New Holland has also the appearance of a natural production, fragments of bark being intermixed with it; it is in more solid masses than the other, is less brittle, and with its astringency has a disagreeable mawkish sweetish taste. The third kind, and which is most commonly met with, has the appearance of an extract thoroughly dried; it is in small fragments, with a resinous fracture, is of a brown colour, more approaching to black than the others, and has a taste astringent and slightly bitter. This Dr. Duncan has stated, is said to be the produce of the coccoloba uvifera. I have also been informed, says Murray, that it is the extract of the wood of the mahogany.

The analysis of kino has been executed; but from the difficulty of ascertaining exactly to what substance the name is applied, there is a difficulty in appropriating the results to any of the varieties that are met with. All of them, however, appear to contain a large proportion of tannin; their solutions giving a deep colour, not purple however, but green, with salts of iron, a copious precipitate with gelatin. The active matter of all, or the greater number of them, is soluble in water, with the assistance of heat, and is still more easily soluble in alcohol.

Kino has been employed as an astringent for the same purposes as catechu, and they are often given in combination. The catechu being more uniform in its qualities, ought perhaps to be prefered.

Kino is exhibited internally, in doses of from ten to thirty grains, in substance, or dissolved in diluted alcohol. It has been considered a powerful remedy in obstinate chronic diarrhœas and dysenteries; in all passive hæmorrhagies, especially from the uterus; in fluor albus; and in diseases arising from laxity of the solids.

LACTUCA SATIVA. *Common Garden Lettuce.* The herb.

This plant, so valuable as an article of diet, abounds with a milky juice, which possesses all the characteristic properties of the opium of the shops, and may be procured from it in sufficient quantity, to repay any labour bestowed on it for this purpose. The laudanum made from the opium of the lettuce increases the pulse in force and frequency, and produces generally the same effects as result from similar doses of common laudanum. It has been used with advantage in allaying the pain of chronic rheumatism, and colic; in checking the frequent stools accompanying diarrhœa; in allaying cough, &c. &c.; and doubtless the plant may be advantageously cultivated for medical purposes, especially as the opium is procured after the period in which the plant is useful for the table.

LACTUCA VIROSA. *Wild or Strong-scented Milk-weed. Lettuce.* The leaves.

This plant is perennial, growing spontaneously on rubbish and beside fences, and flowering in August and September. The Stem rises to three or four feet, and is prickly on its lower end. All the leaves are horizontal and greatly indented; they are arrow shaped, and their mid-rib prickly on the back part. Flowering branches expanding, floral leaves similar to the stem leaves, but smaller. Blossoms numerous on short fruit stalks, yellow, opening about seven and closing about ten in the forenoon.

This plant affords a large quantity of milky juice which smells like opium, and is acrid and bitter. It resembles opium in some of its effects; its narcotic power like that of the poppy head resides in its milky juice. An extract prepared from the expressed juice of the leaves of this plant, gathered when in flower, is recommended in small doses in dropsy. In dropsies of long standing, proceeding from visceral obstructions, it has been given to the extent of half an ounce in a day.

It is said to agree with the stomach, to quench thirst, to be gently laxative, powerfully diuretic, and somewhat diaphoretic. Plentiful dilution is allowed during its operation. Dr. Collin, of Vienna, asserts, that out of twenty-four dropsical patients, all but one were cured by this medicine.

LAURUS CINNAMOMUM. *The Cinnamon Tree.* The bark and its volatile oil.

This valuable tree is a native of Ceylon, in the East Indies, and is now cultivated in Jamaica and other West-India islands. It grows from four to ten feet high, and is very bushy. The leaves resemble those of the laurel, and have the hot taste and smell of cloves when chewed. Cinnamon is the interior bark of the tree; it is thin and convoluted, of a texture somewhat fibrous, of a slight brown colour, having an agreeable pungent taste, with a degree of sweetness and an aromatic flavour. Its virtues chiefly depend on the small quantity of essential oil which it contains. This bark is a very useful and elegant aromatic, more grateful both to the palate and stomach than most other substances of this class. Like other aromatics, the effects of cinnamon are stimulating, heating, stomachic, carminative, and tonic; but it is rather used as an adjunct to other remedies, than as a remedy itself.

The essential oil of cinnamon has a whitish yellow colour, a pungent burning taste, and the peculiar fine flavour of cinnamon in a very great degree. It should sink in water, and be entirely soluble in alcohol. It is principally prepared in Ceylon. This oil is one of the most powerful stimulants we possess, and is sometimes used as a cordial in cramps of the stomach, and in syncope; or as a stimulant in paralysis of the tongue, or to deaden the nerve in toothach. But it is principally used as an aromatic, to cover the less agreeable taste of other drugs.

LAURUS CASSIA. *The Cassia Tree.* The bark and flower buds, gathered before they open.

This tree is very similar to the former. The bark, which is imported from different parts of the East-Indies and from China, has a very exact resemblance to the cinnamon. It is distinguishable from the cinnamon, by be-

ing of a thicker and coarse texture, and by its breaking short and smooth, while the cinnamon breaks fibrous and shivery.

It resembles cinnamon still more exactly in its aromatic flavour and pungency than in its external appearance, and seems only to differ from it, in being considerably weaker, and in abounding more with a mucilaginous matter.

Cassia buds are the flower buds which are gathered and dried before they expand. They are of a brown colour; their taste and flavour is similar to the bark, and they are used for the same purposes.

Both the bark and buds of cassia possess the same properties with cinnamon, though in an inferior degree. The bark is very frequently, and sometimes unintentionally, substituted for the more expensive cinnamon; and the products obtained from cassia bark and buds by distillation, are in no respect inferior to those prepared from cinnamon.

Laurus Camphora. *Camphor Tree.* The camphor.

The camphor laurel grows in great abundance, and to a very considerable size, in the forests of Japan. It is not uncommon in green houses in England.

Camphor is a proximate principle of vegetables, contained in many plants, especially those of the aromatic kind. For the purposes of commerce, it is obtained from the laurus camphora. It exists in distinct grains in the wood of the root and branches of this tree. It is extracted by sublimation; in Europe it is purified by a second sublimation, with the addition of one twentieth of its weight of lime.

Pure camphor is colourless, semitransparent, tenacious, and somewhat unctuous to the touch; its smell is strong and fragrant; its taste pungent and bitter. It is volatile at every natural temperature; is fusible in a heat inferior to 212°; is inflammable; scarcely soluble in water, but entirely soluble in alcohol, ether, and oils, essential or expressed. It consists of carbon and hydrogen, and differs from the essential oils, in containing a larger proportion of carbon, with some oxygen. By combustion it affords carbonic and camphoric acids.

In a moderate dose, camphor produces effects similar to those of other narcotics. Its stimulant operation, how-

ever, is not considerable, even in a small dose; and in a large dose, it always diminishes the force of the circulation; induces sleep, and sometimes causes delirium, vertigo, and convulsions, ending in total insensibility. These violent effects of camphor are most effectually counteracted by opium. In a morbid state of the body, camphor allays inordinate actions. When the pulse is hard and contracted, it renders it fuller and softer.

It removes spasms and flitting pains arising from spasms; and in delirium, when opium fails of producing sleep, camphor will often succeed.

The most general indication for the use of camphor, is the langnor or oppression of the vis vitæ.

It may therefore be given with advantage,

1. In all febrile diseases of the typhoid type, especially when attended with delirium.

2. In inflammations with typhoid fever, as in some cases of peripneumonia and rheumatism.

3. In eruptive diseases, to favour the eruption, or to bring it back to the skin, if from any cause it has receded, as in small pox, measles, &c.

4. In many spasmodic diseases, especially mania, melancholy, epilepsy, hysteria, chorea, hiccough, &c.

5. In indolent local inflammations, not depending on an internal cause, to excite action in the part.

As a stimulant, says Murray, camphor has been used in typhus, cynanche maligna, confluent small pox, and other febrile affections accompanied with debility, in retrocedent gout, and to check the progress of gangrene. As a sedative it is used in affections of an opposite nature, as in pneumonia, rheumatism, and gonorrhœa, combined with nitre or antimonials, or by itself, where evacuations have been made. In mania, it has sometimes succeeded as an anodyne: as an antispasmodic, it has been employed with advantage in asthma, chorea, and epilepsy.

The dose of camphor is from five to twenty grains. It cannot be given with safety in a larger dose than half a drachm; and Dr. Cullen has likewise remarked, that in too small a dose, as that of a few grains, it has very little effect. In divided doses, it may be given to the extent of a drachm or more in the day. Its power of checking the progress of gangrene is promoted by combination with musk, or carbonate of ammonia: combined with opium, it forms a powerful diaphoretic; and its efficacy in inflammatory diseases is augmented by antimonials.

Camphor ought generally to be given in a state of mixture in some fluid form, as being then less apt to excite nausea. It may be diffused in water by trituration with sugar, mucilage, or almonds. To reduce it previously to powder, a few drops of alcohol must be added. Magnesia, by being triturated with it, has the effect of dividing and rendering it smooth, and may be used for its suspension; a number of the gum-resins also act on it in such a manner, that, from their mixture, a soft uniform mass is formed, and this affords another mode of diffusing it in water.

Externally, camphor is applied chiefly as a means of exciting the action of the absorbents, and thus dispersing many kinds of swellings, extravasations, indurations, &c. Hence it is a very common ingredient in liniments. It has also the property of rousing the action of the nerves, and quickening the circulation, in parts on which it is rubbed. For this reason, in paralytic affections it is sometimes employed. As an anodyne in rheumatic and muscular pains, and as a discutient in bruises; and inflammatory affections, it is dissolved in alcohol or expressed oil, and applied by friction to the part. Perhaps there is no composition, that has greater power in exciting the absorption of any tumor or hardness, than camphorated mercurial ointment. Added to collyria, or mixed with lard, it is of service in ophthalmia. Suspended in oil, it is used as an injection in ardor urinæ, and as an enema to relieve the uneasy sensations occasioned by ascarides. The combination of it with opium is useful as a local application in toothach.

Camphor is recommended as singularly efficacious in cases of *ardor urinæ*, or scalding of the urine, and nervous headachs. One of the most eligible forms in which camphor can be given, is, to rub about eighty grains in a mortar, with six or eight grains of myrrh, having previously dropped a few drops of spirits of wine in the camphor; then add ten or fifteen grains of gum arabic, and gradually as much water as will suspend the whole.

LAURUS SASSAFRAS. *Sassafras.* The wood, root, and its bark.

This tree is a native of North America, and is cultivated in Jamaica. The wood, root, and its bark are used; they have a moderately fragrant smell, and a sweetish aromatic taste. Sassafras is a warm aperient

and strengthening medicine; it has often been successfully given in the form of infusion and decoction, for improving the tone of the stomach and bowels, in persons whose humors were in a vitiated state. The essential oil is highly stimulating and heating, and must be given only in very small doses, being a sudorific and diuretic remedy. The bark is useful in intermittents; and the oil is said to be efficacious, applied externally to wens.

LAVENDULA SPICA. *Lavender.* The flowering spikes.

Lavender is a well known small, shrubby, perennial plant, a native of the south of Europe, but frequently cultivated in our gardens for the sake of its perfume. There are two varieties. The flowers of both have a fragrant, agreeable smell, and a warm pungent, bitterish taste; the broad leaved sort is the strongest in both respects, and yields in distillation thrice as much essential oil as the other; it is also hotter and specifically heavier; hence in the southern parts of France, where both kinds grow wild, this only is used for the distillation of what is called oil of spike. The narrow leaved, is the sort commonly met with in our gardens.

Lavender is considered as a warm stimulating aromatic. It is principally used as a perfume.

LEONTODON TARAXACUM. *Dandelion.* The root and leaves.

An indigenous, perennial plant, growing in meadows and pastures, on road sides, ditch banks, &c. It produces a yellow flower, which blows from April to September, and has the remarkable quality of expanding early in the morning, and closing in the evening. The root, leaves, and stalk, contain a large proportion of bitter milky juice, which possesses considerable activity. Its more immediate operation is, to remove visceral obstructions, and promote the urinary discharge: the dose prescribed by Boerhaave for this purpose, is four ounces, to be taken three or four times in a day; and later experience has corroborated its great efficacy in dropsical and other complaints connected with a disordered state of the first passages.

By modern writers dandelion is highly extolled in the treatment of chronic inflammation of the liver, or incipi-

ent scirrhus of that organ, and also in several chronic derangements of the stomach, in a dose of half a drachm of the extract twice a day. Either a strong decoction or the fresh expressed juice, in doses from two ounces to four, two or three times within the twenty-four hours, will, however, be found more active preparations.

LEONARUS CARDIACA. *Motherwort.* The leaves.

This is a very common indigenous plant, growing in waste places, and flowering in July and August. The stalk is square, the leaves are spear shaped and three lobed. The flowers are in thorny whorls, purplish within, and white on the outside. The leaves are opposite, two to each whorl. They have a strong, disagreeable odour, and bitter taste.

Motherwort was formerly supposed to be useful in some nervous and hysterical complaints, and as a strengthener of the stomach. Its medicinal virtues are not undeserving of notice. Though rejected from pharmacopœias, it will not readily be abandoned by the female class, being peculiarly adapted to some constitutions when affected with nervous and hysterical agitations. An infusion of this plant is a common domestic medicine, taken at bed time, it composes and procures refreshing sleep in a manner similar to valerian, when it could not be obtained by the operation of opium.

LICHEN ISLANDICUS. *Iceland Moss.* The herb.

This is a species of liverwort, or rock moss, of which there are many varieties. It is brought from Iceland, where the inhabitants make considerable use of it as an article of diet, and esteem it an excellent remedy in consumption. Of late years it has attracted the attention of physicians in the United States, and acquired considerable repute for its remarkable mucilaginous and nutritive properties. It has a bitter and somewhat astringent taste, which are in some measure destroyed by drying or infusing in water. As a medicine, *Scopoli* and *Haller* recommended it in coughs and consumptions, and it has proved efficacious in diarrhœas and dysentery. Doctor Kerr found it so successful in dysentery, that, after repeated emetics and catharties, he never used any other medicine, except that he occasionally added opium. Dr. Crichton

has a high opinion of it only in two species of consumption: the *phthisis hæmoptoica* and the *phthisis pituitosa* vel *mucosa*; for by the use of this, he has seen patients get so far the better, as to be dismissed from the hospitals cured. It is given in decoction, boiling one ounce and an half in two pounds of milk, *over a slow fire, exactly one quarter of an hour*. If milk disagree, water may be used, to which, after straining, a sufficient quantity of sugar may be added to make a syrup. Three or four ounces of this are to be taken frequently in a day. When continued for several months, it has been found extremely serviceable as a restorative in consumptive cases, attended by debility and an acrimonious state of the blood and juices.

LINUM USITATISSIMUM. *Common Flax.* The seeds and their fixed oil.

Linseed contains about one fifth of mucilage, and one sixth of fixed oil. It is therefore considered as emollient and demulcent. The entire seeds are only used in cataplasms. The mucilage resides wholly in the skin, and is separated by infusion or decoction. The infusion is used as a pectoral drink, and in ardor urinæ, nephritic pains, and during the exhibition of corrosive sublimate. Flaxseed syrup is made by adding to two pints of the mucilage one pint of honey; while simmering away by a gentle heat observe to take off the scum as it rises. This is highly useful in all kinds of coughs, and other diseases of the breast and lungs. The oil is separated by expression. It is one of the cheapest fixed oils; but is generally rancid or nauseous, and unfit for internal use. These seeds, when reduced to powder and properly blended with hot water, form one of the most convenient and useful of cataplasms.

The cake which remains after expression of the oil, contains the farinaceous and mucilaginous part of the seed, and is used in fattening cattle, under the name of oil cake.

LIRIODENDRON TULIPIFERA. *Tulip bearing Poplar. Tulip tree.* The bark of the root.

A native and well known tree in the United States, called also American poplar, white wood, and in some

parts of New-England improperly called *cypress* tree. It attains to a very large size, rising as high as any forest tree, and makes a noble and beautiful appearance when in flower, about the middle of May. This tree is remarkable for the shape of its leaves, having the middle lobe of the three truncate, or cut transversely at the end. The flowers are large and bell shaped; calyx of three leaves, six petals to the corolla, marked with green, yellow, and red spots; and many lance shaped seeds, lying one over another, and forming a sort of cone. The bark of the root has long been employed by medical men in the United States, as a tonic, and when joined with various proportions of *prinos virticillatus*, and *cornus florida*, has afforded a remedy of equal efficacy with Peruvian bark. It is a strong bitter, and considerably aromatic and antiseptic, and has been found particularly beneficial in the last stage of dysentery. The powdered root combined with steel dust is an excellent remedy in relation of the stomach. According to Dr. Barton, the bark is used in some parts in gout and rheumatism. A decoction of it is said to be a common remedy in Virginia for botts in horses.

LOBELIA INFLATA. *Lobelia Emetica. Emetic Weed. Indian Tobacco.* The leaves.

The lobelia inflata is indigenous, and annual, rising to one or two feet, with branched stems. The leaves are oblong, alternate; slightly serrated and sessile. The blossoms are solitary, in a kind of spike, of a pale blue colour. It is found common in dry fields, among barley and rye stubble, and flowers in July and August; its capsules are inflated, and filled with numerous small seeds.

The leaves chewed are at first insipid, says Dr. Cutler, but soon become pungent, occasioning a copious discharge of saliva. If they are held in the mouth for some time they produce giddiness and pain in the head, with a trembling agitation of the whole body; at length they bring extreme nausea and vomiting. The taste resembles that of tartar emetic. A plant possessed of such active properties, notwithstanding the violent effects from chewing the leaves, may possibly become a valuable medicine.

It was employed by the aborigines as an emetic, and also by those empirics who affect to deal in Indian remedies only. As a new article it has lately excited much speculation in the New-England States, and its

properties have very frequently been subjected to the test of practical experiment. It is found to operate as a speedy and active emetic, and it often induces a most profuse perspiration immediately after being received into the stomach. It has proved serviceable in cases of colic, where emetics were indicated. In a variety of instances it has been administered as a remedy in asthmatic affections, and on competent authority we are assured, that it has in general manifested considerable efficacy, and sometimes proved more beneficial in this distressing disease than any other medicine. From some of its effects, says an eminent physician, lobelia seems to be related to the narcotic plants; to the mouth and first passages it proves acrid and highly stimulant; its stimulus appears to be of the diffusive kind, as Dr. Cutler, on taking it, experienced an irritation of the skin over the whole body. It is probably one of the most powerful vegetable substances with which we are acquainted, and no rational practitioner will have recourse to it, but with the greatest precaution. The melancholy consequences resulting from the use of *lobelia inflata*, as lately administered by the adventurous hands of a noted empiric, have justly excited considerable interest, and furnished alarming examples of its deleterious properties and fatal effects. The dose in which he is said usually to prescribe it, and frequently with impunity, is a common tea spoonful of the powdered seeds or leaves, and often repeated. If the medicine does not puke or evacuate powerfully, it frequently destroys the patient, and sometimes in five or six hours.

Even horses and cattle have been supposed to be killed by eating it accidentally. The specific qualities of this highly active plant, promising to be of utility as a remedy, should be particularly investigated by ingenious and intelligent men, that its rank in the Materia Medica may be clearly ascertained.

The following highly interesting observations have been recently received from the Rev. Dr. M. Cutler.

When I was preparing my botanical paper, says the Dr. I had given it (the lobelia) only a cursory examination, and having some doubt about its specific characters, I suspected it to be a new species. Accidentally ascertaining its emetic property, I inserted it with the specific name, *emetic weed*. By chewing a small part of it, commonly no more than one or two of the capsules, it proves a gentle emetic. If the quantity be a little increased, it

operates as an emetic, and then as a cathartic, its effects being much the same as those of the common emetics and cathartics. It has been my misfortune, the author observes, to be an asthmatic for about ten years. I have made trial of a great variety of the usual remedies with very little benefit. In several paroxysms I had found immediate relief more frequently than from any thing else, from the skunk-cabbage. (*Dracontium fœtidum.* Lin. *Arum Americanum.* *Catesby.* See that article in this volume.) The last summer I had the severest attack I ever experienced. It commenced early in August, and continued about eight weeks. Dr. Drury of Marblehead, also an asthmatic, had made use of a tincture of the Indian tobacco, by the advice of a friend, in a severe paroxysm early in the spring. It gave him immediate relief, and he has been entirely free from the complaint from that time. I had a tincture made of the fresh plant, and took care to have the spirit fully saturated, which I think is important. In a paroxysm which perhaps was as severe as I ever experienced, the difficulty of breathing extreme, and after it had continued for a considerable time, I took a table spoonful. In three or four minutes my breathing was as free as it ever was, but felt no nausea at the stomach. In ten minutes I took another spoonful which occasioned sickness. After ten minutes I took the third, which produced sensible effects upon the coats of the stomach, and a very little moderate puking, and a kind of prickly sensation through the whole system, even to the extremities of the fingers and toes. The urinary passage was perceptibly affected by producing a smarting sensation in passing urine, which was probably provoked by stimulus upon the bladder. But all these sensations very soon subsided, and a vigour seemed to be restored to the constitution, which I had not experienced for years. I have not since had a paroxysm, and only a few times some small symptoms of asthma. Besides the violent attacks, I had scarcely passed a night without more or less of it, and often so as not to be able to lie in bed. Since that time I have enjoyed as good health as, perhaps, before the first attack.

I have given you this minute detail of my own case, from an apprehension that this plant, judiciously employed, may approach nearer to a specific in this most distressing complaint, than any other that has been yet discovered. But I am aware much further experiment

is necessary to ascertain its real value. Several medical gentlemen have since made use of the tincture in asthmatic cases with much success, but the effects have not been uniformly the same. In all instances of which I have had information, it has produced immediate relief, but the effect has been different in different kinds of asthma. Some patients have been severely puked with only a tea spoonful, but in all cases some nausea seems to be necessary. The asthma with which I have been afflicted, I conceive to be that kind which Dr. Bree, in his *Practical Inquiries on disordered respiration*, &c. calls the first species—"a convulsive asthma from pulmonic irritation of effused serum." My constitution has been free, I believe, from any other disorder, than what has been occasioned by an affection of the lungs, anxiety of the præcordia, and straitness of the breast, and other symptoms produced by that affection. In similar asthmas, the tincture has been as successful as in my case. It is extremely desirable that careful experiments should be made by men of real medical knowledge.

A particular case has been related to me of an effectual cure of the hydrophobia, in the last stage of the disease, by the use of this plant. I had the information from a man of undoubted veracity, that received it from the father of the young man who was cured; but facts relating to the case have not been sufficiently ascertained to assert it to be a remedy in this disease. In a short time I expect to obtain a more circumstantial and satisfactory account of this case.

With the view of establishing a uniformity of strength in the preparation, the Essex district medical society have agreed, that the proportion for the tincture of lobelia shall be two ounces of the dried plant to one pint of diluted alcohol.

The result of subsequent practical observation has amply confirmed the utility of lobelia inflata in various diseases. In numerous instances of asthma it has procured the most essential relief, though in general its effects were only temporary and palliative. As a pectoral it has been found useful in consumptive and other coughs depending on mucus accumulated in the bronchial vessels by exciting nausea and expectoration. From its very speedy operation as an emetic, and its stimulating effects on the mouth and fauces, beneficial results might be expected from its use in croup and hooping-cough; and on

some trials our expectations have been realized in this respect. It may perhaps be anticipated to supersede seneka as a remedy in the former, and antimonials in the latter affection. More extensive practical knowledge of the properties of this plant, and the various forms and circumstances of its administration is still, however, a most desirable object.

The leaves should be collected in August while the plant is in blossom, and carefully dried and preserved for use. From ten to twenty grains of the powdered leaves will in general be found a suitable dose as an emetic for an adult, or it may be repeated in smaller quantities. As a pectoral it may be given in powder or pills alone, or combined with other remedies, repeated in small doses till an evident good result is observable. Of the saturated tincture, twenty, forty, or even sixty drops may be safely given children of one or two years old, increasing as occasion may require.

Lobelia Syphilitica. *Lobelia.* The root.

This plant grows in moist places in Virginia. It is perennial, has an erect stalk, three or four feet high, blue flowers, a milky juice, and a rank smell. The root, which is the part used, consists of white fibres about two inches long, resembles tobacco in taste, which remains on the tongue, and is apt to excite vomiting.

Dr. Barton says, it is considerably diuretic; and Mr. Pearson found, that it generally disagreed with the stomach, and seldom failed of affecting the bowels as a strong cathartic. It certainly possesses no power of curing syphilis; even the Indians who have the disease, are glad of an opportunity of applying to the whites. It is said to have cured gonorrhœa.

Lytta Vittata. *Potatoe Fly.*

There are four species of meloe that blister, found in the United States. The lytta vittata was first brought into notice by Dr. Isaac Chapman, of Buck's county, Pennsylvania. It feeds principally upon the potatoe vine, and, at the proper season of the year, may be collected in immense quantities. This insect has a very near resemblance, in its outward form, to the meloe vesicatorius, or Spanish fly; but is rather smaller, and of a very differ-

ent colour; the head is a very light red, with black antennæ; the elytra or wing cases are black, margined with pale yellow, and a stripe of the same colour extends along the middle of them; the tarsi have five articulations; the mouth is armed with jaws, and furnished with tarsi.

In the abdomen of this fly, is a hard, white substance, about the size of a grain of wheat, which, when powdered, appears like meal, and, when rubbed with water, forms a milky emulsion.

The experiments and investigation of Dr. Chapman have proved, that, when applied to the human system, the effects of the potatoe fly, are perfectly analogous to those of the Spanish cantharis; being equal, if not superior to them in medicinal powers.* The lytta vittata is now introduced into the Materia Medica of the Massachusetts Pharmacopœia, and its properties have been made the subject of a valuable communication to the Medical Society of Massachusetts, by Dr. John Gorham of Boston. From this interesting paper it appears, that for some years past, the potatoe fly has been employed as a vesicatory by Dr. Israel Allen, of Sterling. That the insect in its dried state, is from four to six lines in length, its head and elytra are uniformly black, and the latter want the margin and stripe of yellow, observable in that described by Dr. Chapman. Its belly is ash coloured, and in the cavity of the abdomen is found the hard white substance already described. The thickness of the potatoe fly, which is nearly uniform throughout, is from one quarter, to one third its length. It generally appears on the vines, about the end of July, and the first week in August. They inhabit the soil at the foot of the plant; they ascend in the morning and afternoon, but generally avoid the heat of the sun at noon. As they fly with great difficulty, they are easily caught, and are prepared for medicinal purposes, by shaking them from the plant into hot water, and afterwards drying them by the sun's rays. Dr. Gorham proceeds to observe, that he has instituted an extensive series of experiments with the lytta vittata; and that they have never failed, even in a single instance, of producing all the immediate effects which he anticipated, from their external application, or internal exhibition: as a vesicatory, he has found them equal, if not superior to the cantharis usually employed for that purpose in this country.

* Med. Repos. vol. 2.

The saturated tincture has been administered internally, in many cases of diminished sensibility of the urinary organs, in gleets, and as a diuretic in dropsy; and it has been found, in all, to increase the discharge of urine, and to produce a considerable irritation in the urethra, and in the neck of the bladder. It appears, therefore, from the combined testimony of Drs. Chapman, Gorham, and Allen, that physicians, in various parts of the country, may collect from their own fields, an annual visitor, possessing all the properties of the genuine cantharis. This indigenous production cannot fail of being generally adopted, as an excellent substitute for an expensive exotic, not always to be obtained.

We shall notice another kind of indigenous blistering fly, the *meloe niger* of Professor Woodhouse, or the Pennsylvanicus of Linnæus. This is not more than half the size of Chapman's fly, and is uniformly black. It feeds upon the *prunella vulgaris*, or self heal, and *ambrosia trifida*, or stick weed. During the month of August, the farmers of New England find them in immense quantities, extracting nourishment from the potatoe vine, which in some seasons they almost destroy. These flies, it is well ascertained, are not inferior in point of efficacy to any other species, whether of foreign or domestic production, and they seldom excite strangury when applied externally.

MALVA SYLVESTRIS. *Common Mallow.* The leaves and flowers.

This is an annual plant, growing in hedges, foot paths, and among rubbish. The whole plant abounds with mucilage. The leaves were formerly often used in food, to prevent costiveness. At present, decoctions of the plant are sometimes prescribed in dysenteries and urinary complaints; though it is chiefly employed in emollient cataplasms, clysters, and fomentations.

MARANTA ARUNDINACEA. *Indian Arrow Root.* The root.

This plant was originally the production of the East Indies, and is now cultivated in Jamaica and other West India islands, and in South America. Arrow root agrees with sago, salep, and tapioca in its general nutritious property, but is reckoned to excel them, so far as to afford a

much larger proportion of mucilage than any vegetable hitherto discovered. Hence it is of superior utility as an article of diet for the sick and invalids, and particularly in cases of acrimony, either in the general habit, as in hectic fever or consumption; or in particular secretions, as in affections of the urinary passages, namely, inflammation, stone, or gravel; and also in affections of the bowels, as in looseness and dysentery. It furnishes also an excellent remedy for the bowel complaints, which so commonly prevail in the United States during the warm season, especially among children. The jelly is made by adding to a table spoonful of the powdered root as much cold water as will make it into a soft paste, then pour on boiling water, stirring it at the same time briskly, until it become a clear jelly, which may be seasoned with sugar and nutmeg, or a little wine or lemon juice may be added. For children it may be prepared with milk, and if it ferment on the stomach, the addition of a little animal jelly will obviate that effect. Prepared in the form of pudding the arrow root powder is far preferable to any of the farinaceous substances, and affords a delicate and very proper food for convalescent patients. According to Dr. Wright, of Jamaica, a decoction of the fresh root makes an excellent ptisan in acute diseases. In a pamphlet published in 1796, by Mr. T. Rider, we find the culture of this valuable article highly recommended to the West Indian planters, and the new African colonists, as an object of commerce, and the most eligible substitute for starch made of wheat. By the author's computation eight millions of pounds weight of starch are made annually in Great Britain alone from that valuable grain. It appears also by the same authority that arrow root starch is of the finest quality, and that one pound of it is equal to two pounds and a half of that prepared from wheat. Fortunately the arrow root has of late years been introduced into the states of South Carolina and Georgia, and by practical experiment it is ascertained that the soil of the southern sea coast is well adapted to it. John Cooper, Esq. an opulent planter on St. Simon's, and Campbell Wylly, Esq. of Sapelo island, have, it is understood, so far succeeded in their attempts as to afford the most flattering encouragement, that this important article may be added to the numerous sources of wealth enjoyed by our southern planters. The latter gentleman asserts, that a spot of land on his plantation

yielded arrow root sago in the proportion of 1810 pounds to the acre. No production it is presumed can promise a more ample remuneration, to stimulate the planter to attempt its cultivation; and when it is considered, that, in proportion to the produce, the demand will be extended, its claim as a rival staple with rice and cotton may, perhaps, be anticipated.

MARRUBIUM VULGARE. *White Horehound.* The leaves.

This is a perennial plant, which grows wild on road sides, and among rubbish. The leaves have a very strong, not disagreeable smell, and a roughish, very bitter taste. It is reputed to be both attenuant and resolvent; an infusion of the leaves in water, sweetened with honey, is recommended in asthmatic and phthisical complaints, as well as in most other diseases of the breast and lungs. They promote the fluid secretions in general, and liberally taken, loosen the belly.

Dr. Withering observes that it was a favourite medicine with the ancients in obstructions of the viscera. He says, that it is the principal ingredient in the negro Cæsar's remedy for vegetable poisons. That a young man who had occasion to take mercurial medicines, was thrown into a salivation which continued for more than a year. Every method that was tried to remove it, rather increased the complaint. At length Linnæus prescribed an infusion of this plant, and the patient got well in a short time.

MEL. *Honey.*

A sweet fragrant vegetable juice, collected by bees from the flowers of various plants, and deposited in the cells of the comb. The honey produced by young bees, and which flows spontaneously, is purer than that expressed from the comb; whence it is called virgin honey: the best sort is of a thick consistence, and of a whitish colour inclining to yellow; it possesses an agreeable smell and a pleasant taste. In some situations, where noxious plants abound, poisonous honey is met with, from the bees feeding on such flowers. As an article of food, when immoderately used, honey is pernicious to weak stomachs: it ought therefore to be avoided by persons liable to eruptions of the skin, or in whom there is a redundancy of

bile. This vegetable substance contains an acid similar to that of sugar, but is more spiritous: hence it readily ferments, occasions flatulency, and in some habits produces gripes and looseness. As a medicine, however, it is a very useful aperient and expectorant, especially when it has been previously boiled; in which state, it may be used with safety and advantage by asthmatic patients; for it tends to dissolve viscid humours, and to promote the expectoration of tough phlegm.

Honey is also convertible into an agreeable liquor termed mead; and it may be advantageously employed in the following manner: dissolve one pound of honey in three or four quarts of water, and being exposed to a temperature between the 70th and 80th degree of *Fahrenheit's* thermometer, it will in a short time become a very agreeable acid liquor, which possesses an aromatic flavour and strength, superior to that of the best vinegar made of white wine. This cheap and agreeable substitute for white wine vinegar appears to deserve every attention in domestic economy.

MELALEUCA LEUCADENDRON. *The Cajeput Tree.* The volatile oil.

The tree which furnishes the cajeput oil is frequent in the East Indies. The essential oil, obtained by distillation from the leaves and fruit, has a green or yellowish colour, a strong fragrant odour, and an extremely pungent taste. It is highly volatile. This oil has been used as a highly diffusible stimulant and antispasmodic, in tympanites, hysteria, palsy, chronic rheumatism, and various other diseases of debility. Its dose is three or four drops. It is also applied externally to relieve rheumatic and gouty pains, and violent headachs. But its most remarkable effect is in that painful complaint the toothach. From whatever cause this affection may proceed, whether from a carious tooth, rheumatic acrimony, catarrh, &c. the cajeput oil has generally been found efficacious in removing it, if dropped on lint, and placed in the cavity of the tooth, or even around the gum.

MELIA AZEDARACH. *Poison Berry Tree. Pride of India or China.* The fruit and root.

This is not a native of America, but is now completely naturalized to the states of Carolina and Georgia; where

it is highly valued for the beauty of its foliage, and agreeable shade, which it affords during the sultry season. In the city of Savannah the streets and public walks are ornamented by rows of this charming tree, and the compiler has recently been gratified with the enchanting view which they exhibit. The azedarach has also obtained considerable repute for the medicinal virtues which it is found to possess. Professor Barton says, it is one of the most valuable anthelmintics that has hitherto been discovered, and many respectable physicians in Savannah repose the fullest confidence in its efficacy. To Dr. L. Kollock, vice-president of the Georgia Medical Society, we are indebted for the following information. "It is a vermifuge of efficacy. Its use is in some measure general among the planters; and with many supersedes the use of all others. I have given it with success where all others in common use have failed of relieving. But when given in the months of March and April, while the sap is mounting into the tree, it has sometimes been followed by stupor, dilatation of pupil, stertorous breathing, subsultus, &c. But these symptoms, like those sometimes produced by spigelia, pass off without any perceptible injury to the system. This article, like the spigelia, is also a useful febrifuge medicine, in those affections usually denominated verminous fevers, but where no worms are voided. The common form is that of decoction. A large handful, say about four ounces of the bark of the fresh root is boiled in a quart of water, till it acquire the colour of strong coffee, i. e. to about a pint, of which from half an ounce to an ounce may be given every two or three hours till it operate. Given in this manner, its operation is powerful, sometimes both vomiting and purging. The strength of the decoction is however varied according to the intention." The dried berries of this tree have been advantageously employed as an anthelmintic, in Carolina; children being allowed to eat them at pleasure. The pulp of the fruit formed into an ointment with lard, it is said, has been successfully employed in tinea capitis.

MELISSA OFFICINALIS. *Balm.* The leaves.

Balm is much cultivated in our gardens on account of its pleasant aromatic smell, resembling that of the lemon, and its fragrant though roughish taste. It is principally employed in the form of a watery infusion, which is drunk

in the manner of tea; and in acute fevers, when acidulated with the juice of lemon, it is an useful diluent.

Meloe Vesicatorius. *Cantharis. Spanish Flies.*

The cantharis is an insect, collected from the leaves of plants in Spain and Italy, and dried in the sun. It is of a lively green colour; has a faint unpleasant smell, and a taste slightly acrid. The active matter of this insect inflames and excoriates the skin, and is used as the basis of the common vesicatories. Taken internally they often occasion a discharge of blood by urine, with exquisite pain: if the dose be considerable, they seem to inflame and exulcerate the whole intestinal canal; the stools become mucous and purulent; the breath fœtid and cadaverous; intense pains are felt in the lower belly: the patient faints, grows giddy, delirious, and dies. Applied to the skin, they first inflame, and afterwards excoriate the part, raising a more perfect blister than any of the vegetable acrids, and occasioning a more plentiful discharge of serum. But even the external application of cantharides is often followed by a strangury, accompanied with thirst and feverish heat. The inconveniences arising from the use of cantharides, whether taken internally, or applied externally, are best obviated by drinking plentifully of bland emollient liquids, such as milk, decoctions of barley, linseed, solutions of gum arabic, &c. or by pouring warm water from a bottle, upon the lower part of the belly, as the person lies in bed. The specific property of counteracting cantharides ascribed to camphor, says Dr. Duncan, has no foundation. Internally administered, it acts with much violence on the urinary passages. In dropsy, it has been given as a diuretic, in a dose of one grain once or twice a-day, or a few drops of the tincture continued for some time: it has been prescribed in a similar manner in obstinate gleet and leucorrhœa, and in retention of urine arising from debility of the body, of the bladder, or in the opposite affection of incontinence of urine from debility of the sphincter. It is principally in these two last affections, that the internal administration of cantharides is attempted. The tincture has been of late much recommended in tetanus, &c. and in some instances has proved useful.

Applied externally, cantharides are one of our best and most powerful remedies. By proper management they

may be regulated so as to act as a gentle stimulus, as a rubefacient, or as a blister.

Blisters are applied, 1. To increase the activity of the system in general, by means of their irritation.

2. To increase the activity of a particular organ.

3. To diminish morbid action in particular organs, by means of the irritation they excite in the parts to which they are applied.

They may be employed with advantage in almost all diseases accompanied with typhus fever, especially if any important viscus, as the brain, lungs, or liver, be at the same time particularly affected. In these cases the blisters are not applied to the diseased organs themselves, but as near them as may be convenient. When we wish to excite action in an organ, the blisters are, if possible, applied directly to the diseased organ.

Cantharides are employed externally, either in substance mixed up with wax and resin, so as to form a plaster, or ointment, or in the form of tincture.

After a blister has been raised, it is often of advantage to convert the serous into a purulent discharge, by exciting suppuration, which is done by applying to the blistering part any acrid stimulating ointment; one, for example, containing a small proportion of powdered cantharides; which answers the purpose by the irritation it keeps up, or which is preferable the savine cerate, the favourite application of Mr. Crowther. It is a practice often employed with advantage in asthma, paralysis, and a variety of chronic affections. Dr. Philip S. Physick, and Dr. Rush, have in several instances experienced the efficiency of blisters to arrest the progress of mortification when applied to the diseased part.

Mentha Viridis. *Spearmint.* The herb.

Spearmint is perennial and grows on the banks of rivers, and in watery situations; and flowers in the months of July and August. The leaves have a warm, roughish, somewhat bitterish taste; and a strong, not unpleasant, aromatic smell. Their virtues are stomachic and carminative.

Mentha Piperita. *Peppermint.* The herb.

Of the different mints, this is the one which has the greatest degree of pungency. The leaves have a strong,

rather disagreeable smell, and an intensely pungent aromatic taste, resembling that of pepper; and accompanied with a peculiar sensation of coldness. They afford an essential oil, rich in the aromatic quality of the herb. It also contains a small portion of camphor.

Peppermint is used as a stimulant and carminative, to obviate nausea or griping, or to relieve the symptoms resulting from flatulence, and very frequently to cover the taste and odour of other medicines. It is also an excellent stomachic, of great use in flatulent colics, languors, and hysteric cases, and in vomiting. It is used under the forms of the watery infusion, the distilled water, and the essential oil. This last being dissolved in a due proportion of rectified spirit of wine, and coloured with green grass, forms the essence of peppermint of the shops; a fashionable and pleasant carminative, which, when taken on sugar, imparts a glowing taste, sinking into the tongue, and extending its effects through the whole system, instantly communicating a glowing warmth.

MENTHA PULEGIUM. *Pennyj Royal.* The herb and flower.

This herb is perennial, and possesses properties similar to those of the mint: but it is more acrid, and less agreeable to the palate. It has long been esteemed as an aperient and deobstruent, particularly in hysteric and other female complaints. Dr. Withering observes, that the expressed juice of penny royal, with a little sugar, is an useful medicine in the hooping-cough.

MIMOSA CATECHU. *Catechu.* The extract of the wood called extract of catechu.

To this substance, formerly known by the absurd name of Japan earth, the appellation of Catechu is now appropriated. It is an extract prepared by boiling the interior wood of the tree with water, and the tenacious residual mass is dried by exposure to the air and sun. It is of a yellow or brown colour, has a bitter and astringent taste, leaving an impression of sweetishness; but its qualities vary considerably. Two kinds are at present met with in the shops; one is of a light yellowish brown colour, is smooth and uniform in texture, breaks short, is soft and light; the other is of a dark brown colour, more heterogeneous, heavier, and considerably harder.

Catechu is almost entirely soluble in water, with the assistance of heat, the residuum consisting of accidental impurities. It is nearly equally soluble in alcohol. Its solution strikes a deep black colour with the salts of iron, and gives an abundant precipitate with animal gelatin. From Mr. Davy's experiments, it appears to be composed of tannin, extractive matter, and mucilage; the proportions in the best catechu being 54.5 of the first, 34 of the second, 6.5 of the third, and 5 residual matter. Our knowledge with regard to the principal named extract, is so imperfect, that it is difficult to establish any certain conclusion with regard to it; and the subsequent experiments of Dr. Bostock, as to the modes of separating what is called extract from the tannin of catechu, do not exactly accord with those of Mr. Davy. Dr. Bostock has remarked, too, that catechu gives indications of the presence of gallic acid, and that its watery infusion even reddens the more delicate vegetable colours.

Catechu is in common use as an astringent, and in the uniformity and certainty of its operation is probably equal, or even superior to any of the vegetable astringents. It is used in diarrhœa generally under the form of the infusion, or the tincture: or the officinal preparation, the electuary of catechu, consisting of catechu and kino with some aromatics and a little opium, is diffused in water, forming what has been named the Japonic mixture. In substance it may be given in a dose from ten to forty grains, which may be frequently repeated. Under the form of troches, it is sometimes used in relaxation of the uvula, or sponginess of the gums, being allowed to dissolve slowly in the mouth. It is also successfully employed in complaints peculiar to females, laxity and debility of the viscera in general, and in various other diseases, which require strengthening remedies. As a mild but excellent astringent it is applied with much advantage to apthous eruptions, or the thrush, and similar affections.

MIMOSA NILOTICA. *Egyptian Mimosa. Gummi Arabicum.* The gum, called gum arabic.

This, the purest of the gums, is obtained by exudation from the mimosa, which grows in the sandy deserts of Africa, Arabia Petræa, and Egypt. There are two kinds of gum found in the shops, and sold promiscuously: distin-

guished by the names of Gum Arabic, and East India Gum. Gum arabic consists of roundish transparent tears, colourless, or of a yellowish colour, shining fracture, without smell or taste, and perfectly soluble in water. The pieces which are most transparent, and have least colour, are reckoned the best. They are sometimes selected from the gum arabic in sorts, and sold for about double the price, under the title of picked gum.

It has all the properties of gum; is insoluble in alcohol or oils, and soluble in water, forming a viscid solution termed mucilage. Gum arabic is used as a demulcent. In catarrh it is allowed to dissolve slowly in the mouth, and its mucilage is the basis of the mixtures usually employed to allay coughing. Its solution in water, more or less viscid, is frequently exhibited in diarrhœa, dysentery, tenesmus, strangury, and ardor urinæ. In pharmacy, mucilage of gum arabic is employed for a variety of purposes. It serves to suspend heavy powders in waters; it gives tenacity to substances made into pills, and it effects a partial union of oils, balsams, and resins, with water.

Gum, says Dr. Duncan, is highly nutritious. During the whole time of the harvest, of the journey, and of the fall, the Moors of the desert live almost entirely upon it; and experience has proved, that six ounces are sufficient for the support of a man during twenty-four hours.

M. Golberry says, that he saw a young Englishman in Gambia recover from a very severe hæmoptysis, by taking three ounces of gum, daily, dissolved in milk.

Moschus Moschiferus. *The Musk Deer.* The substance contained in a follicle situated near the navel, called musk.

The musk animal is an inhabitant of China, India, and Tartary. It is a gentle and timid animal; its general form resembles the deer tribe, and is about three feet in length. In the male, behind the navel, and before the prepuce, there is situated an oval bag, flat on one side, and convex on the other, about three inches long and two broad. In the adult animal this sac is filled with a secreted matter, known by the name of musk.

Fine musk comes to us in round thin bladders; which are generally about the size of a pigeon's egg, covered with short brown hairs lined with a thin brown membrane, well filled, and without any appearance of having been

opened. The musk itself is dry, with a kind of unctuosity, of a dark reddish brown, or rusty blackish colour, in small round grains, with very few hard black clots, and perfectly free from sandy or other visible foreign matter. If chewed, and rubbed with a knife on paper, it looks smooth, bright, yellowish, and is free from grittiness. Its taste is somewhat bitterish, and its smell extremely powerful and peculiar. Musk yields part of its active matter to water, by infusion; by distillation the water is impregnated with its flavour; alcohol dissolves it, the impurities excepted.

Musk is a medicine of very great efficacy, and for which, in some cases, there is hardly any substitute. When properly administered, it sometimes succeeds in the most desperate circumstances. It raises the pulse without heating much; it allays spasms, and operates remarkably on the brain, increasing the powers of thought, sensation, and voluntary motion. It is administered with advantage in the greater number of spasmodic diseases, especially in hysteria and singultus, and also in diseases of debility. In typhus it is employed to relieve subsultus tendinum, and other symptoms of a spasmodic nature. In cholera it frequently stops vomiting, and, combined with ammonia, it is given to arrest the progress of gangrene. It is also used with the greatest benefit in exanthematous and phlegmonic diseases, accompanied with typhoid fever, and also in chin cough, epilepsy, trismus, &c. Its dose is from six to twenty grains, repeated, if necessary, every five or six hours. It is best exhibited in the form of bolus. To children, it is given in the form of enema, and is an efficacious remedy in the convulsions arising from dentition.

Murias.

Muriate is the generic term for those secondary compounds, which contain muriatic acid. The muriates may be divided into three families.

1. Alkaline muriates,—soluble in water, fusible and vaporizable without decomposition, forming no precipitate with alkaline carbonates.

2. Earthy muriates,—generally soluble in water, decomposable by heat, forming a white precipitate with alkaline carbonates.

3. Metalline muriates,—The muriatic acid is capable

of combining with many metals, in two states of oxidizement. The muriates which contain the metal in the state of protoxide, are in general very acrid, and soluble both in water and in alcohol. The muriates which contain the metal in the state of peroxide are often insoluble, have a white colour, and contain an excess of base, or are sub-muriates. The muriates are also the most volatile of the metallic salts, and often rise undecomposed in sublimation or distillation.

Murias Ammoniæ. *Muriate of Ammonia. Sal Ammoniac.*

Muriate of ammonia is found native, especially in the neighbourhood of volcanos. It was first prepared in Egypt, from the soot of camel-dung, by sublimation. But the greatest part of that now used, is manufactured in Europe, either by combining directly ammonia with muriatic acid, or by decomposing the sulphate of ammonia by means of muriate of soda, or the muriates of lime and magnesia by means of ammonia. It is prepared in solid masses, semitransparent, and somewhat ductile. It is volatile in a small degree of heat; its alkali is extricated in pungent vapours on the admixture of quick-lime; its acid is extricated in white fumes, on pouring concentrated sulphuric acid upon it. It dissolves in rather less than thrice its weight of water.

Sal ammoniac, when pure, promotes perspiration, and, in some cases, increases the secretion of urine. A drachm of it dissolved in water, if the patient be kept warm after taking it, generally proves sudorific. By moderate exercise in the open air, it operates beneficially on the kidneys; given in a large dose, it proves aperient; and in a still larger, it acts as an emetic.

As a cooling and diaphoretic medicine, the sal ammoniac, dissolved either in vinegar and water, or combined with small doses of the Peruvian bark, has often been attended with the best effects, when taken in fevers, and especially in intermittents, after the intestinal canal has been properly evacuated.

This salt has also been employed externally in lotions and embrocations, for scirrhous and other indolent tumours; for removing warts and other excrescences, and in gargarisms for inflammation of the tonsils. Externally applied, sal ammoniac is a valuable remedy. It may

act in two ways, 1. By the cold produced during its solution. It is from this cause that fomentations of muriate of ammonia probably prove beneficial in mania, apoplexy from plethora, lesions of the head, and in violent headachs. When used with this intention, the solution should be applied as soon as it is made. 2. By the stimulus of the salt. On this principle we may explain its action as a discutient in indolent tumors of all kinds, contusion, gangrene, psora, ophthalmia, cynanche, and in stimulating clysters. In some cases, as in chilblains, and other indolent inflammations, both modes of action may be serviceable. When first applied, the coldness of the solution will diminish the sense of heat and uneasiness of the part, and the subsequent stimulus will excite a more healthy action in the vessels.

MURIAS SODÆ. *Muriate of Soda. Common Sea Salt.*

This is the most common of all the neutral salts. It is not only found in immense masses, on, and under the earth's surface, and contained in great quantities in many salt springs; but it is the cause of the saltness of the sea. Common salt differs from all other neutral substances of this nature, in its taste being purely saline, and occasioning thirst after it has been swallowed. The primitive figure of its crystals is that of a cube; but, on evaporating a solution of salt, the small cubic particles assume the secondary form of hollow squares. When the crystals are perfectly pure, they are not affected by moist air; and in this state, one hundred parts, according to Bergman, contain fifty-two of muriatic acid, or spirit of salt; forty-two of soda, or mineral alkali; and six of water of crystalization.

Nature furnishes us with this neutral salt, either in a solid state; in mines; or dissolved in the sea; or in saline springs. If it be obtained from the bowels of the earth, it is called rock-salt; and is generally very hard and transparent, though it is sometimes opaque, white, and sometimes of red, green, blue, or other shades. The purest of this kind is colourless; the other species are purified by solution in water, and by recrystalization, before they can be employed for culinary purposes. The principal mines of rock-salt are in the vicinity of Cracow, in Poland, and at Northwich, in the county of Chester. The salt, however, which is thus easily procured, and in

very large masses, by no means affords a sufficient supply: hence numerous persons are employed in extracting it from *sea-water*, or from *saline springs*. The former yields only from one 50th to one 30th part of its weight; but the latter produce the greatest quantities; and we are informed by Dr. Brownrigg, that the celebrated saline springs in Great Britain contain more than one 6th part of good salt.

Common salt is obtained from these natural solutions by three different methods: first, the saline fluid is speedily evaporated, till the salt begin to concrete, and settle in the form of grains at the bottom of the pans; after which it is put into proper vessels for draining the brine: and when the process is completed, it is called *bay salt*. By the second method the evaporation is slow and gradual; so that it is continued only till a saline crust is formed on the surface of the liquor, which soon shoots into crystaline cubes.

The manufacture of salt in the United States is of more importance than is generally imagined. It appears, that from the 1st of October, 1800, to the 30th of September, 1801, 3,282,063 bushels of salt were imported, and of this quantity more than one-third was imported from England. This salt, which chiefly comes from Liverpool, and the Mersey, according to Dr. Mitchell, is both weak and impure; as sea-water, brine springs, and rock-salt, generally abound with various other earthy and saline ingredients, such as lime, magnesia, epsom-salt, gypsum, glaubers salt, &c. all of which injure the quality of salt, and disqualify it for preserving animal flesh.

On the shores of Cape Cod, and some other parts of Massachusetts, marine salt is manufactured to very considerable profit and extent, from sea-water, evaporated by the rays of the sun. The whole annual amount cannot be estimated; great improvements having been made in the construction of the works, and in abridging the performance of labour, the manufacture is rapidly increasing. There is, however, every reason to conclude, that, with proper exertion and encouragement, this article might be furnished from our own shores, sufficiently abundant for the consumption of the New England States.

This domestic salt excels in purity, whiteness, and weight: and is not inferior to the first quality of Isle of May salt. A circumstance which adds to its excellency,

is, that during the process of evaporation, the lime is entirely separated from it, by subsiding to the bottom of the vats.

Basket salt, may be prepared from small fine crystals of common salt, which must be cleansed, or purified, by dissolving, and again evaporating to dryness; in which state it may be reduced to fine powder, and pressed hard into wicker-baskets, and dried at the stove or oven for use.

With respect to its medicinal properties, common salt, when taken in small quantities, promotes the appetite and digestion; but, if given in large doses, for instance half an ounce, it operates as a laxative. It is useful in some cases of dyspepsia; and in large doses, it is said to check vomiting of blood. According to Dr. Rush, a table spoonful of fine salt, taken dry, has frequently afforded instant relief in hæmoptysis and other hæmorrhagies. It is a common ingredient in stimulating clysters, and is sometimes applied externally, as a fomentation to bruises, or in the form of bath, as a gentle stimulus to the whole surface of the body. [See the articles vinegar and lemon juice.]

MYRICA CERIFERA HUMILIS. *Dwarf Candleberry Myrtle. Bayberry.* The bark of the root.

There are in the United States several species of this plant, from which myrtle wax is obtained in abundance. The dwarf candleberry myrtle, commonly called in the New England States, bayberry, is a plant which possesses considerable medicinal virtues. The bark of the root is much employed by common people in jaundice, from obstructions to the flow of bile. This medicine has been employed by the aborigines as a mild emetic. According to Dr. James Mann, of Wrentham, who has used the bark in powder, its strength is equal to ipecacuanha. A more particular acquaintance with its medicinal properties ought to be attempted by practical experiments.

MYRISTICA MOSCHATA. *The Nutmeg Tree.* The kernel of the fruit, called nutmeg; its involucre, called mace; its fixed oil, called oil of mace; and its volatile oil.

Under the officinal name myristica, are comprehended nux moschata or nutmeg, and macis or mace; the for-

mer being the seed or kernel of the fruit, the latter the covering with which it is immediately surrounded. The tree which furnishes this elegant spice is a native of the Molucca islands. Nutmegs are round, of a grayish colour, streaked with brown lines, slightly unctuous; they have a strong aromatic flavour, and a pungent taste. They yield their active matter entirely to alcohol: distilled with water, they afford a fragrant essential oil; by expression, a sebacious oil is obtained from them, retaining their fragrant odour, and part of their pungency.

Nutmeg is used in medicine as a grateful aromatic, stomachic, and astringent: hence this drug has often been administered in diarrhœas and dysenteries, in doses from ten to twenty grains in powder, or in larger quantities, when infused in port wine. In violent headachs arising from a debilitated stomach, small doses of this medicine have frequently been found of real service; but, if injudiciously employed, it is apt to affect the head not unlike opium, and other powerful narcotics.

Mace, the involucre of the nutmeg, is a thin unctuous membrane, of a yellowish colour, which it acquires by being dried in the sun. It emits a very fragrant agreeable odour, and has a pleasant though acrid and oleaginous taste.

It is reputed to be an excellent carminative, and stomachic, possessing all the virtues of the nutmeg, with less astringency. Its oil, whether distilled or expressed, is equally efficacious; and when taken internally, in doses from one to five drops, frequently affords relief in colics. Externally, it is of great utility, if rubbed on paralytic limbs; it also promotes digestion, and often prevents vomiting and hiccoughs on being applied to the region of the stomach.

MYROXYLON PERUIFERUM. *Sweet smelling Balsam Tree.*

The balsam, called Peruvian balsam.

This tree grows in the warmest provinces of South America, and is remarkable for its elegant appearance. Every part of it abounds with resinous juice, even the leaves are full of transparent resinous points like those of the orange tree.

The balsam, as brought to us, is commonly of the consistence of thin honey, of a reddish brown colour, inclining to black, an agreeable aromatic smell, and a very

hot biting taste. It is said to be obtained by boiling the cuttings of the twigs in water, and skimming off with a spoon the balsam which swims on the top. Peruvian balsam consists of a volatile oil, resin, and benzoic acid. It is accordingly entirely soluble in alcohol, and in essential oils.

Balsam of Peru is a very warm aromatic medicine, considerably hotter and more acrid than copaiva. Its principal effects are, to warm the habit, to strengthen the nervous system, and to attenuate viscid humors. Hence its use in some kinds of asthmas, gonorrhœas, dysenteries, suppressions of the uterine discharges, and other disorders proceeding from a debility of the solids. It is also employed externally for cleansing and healing wounds and ulcers. "In several cases of tetanus that have fallen under my notice arising from wounds," says Dr. L. Kollock, of Savannah, "I have attributed the cure to the external application, and internal use, of balsam of Peru, whose influence has in several instances almost immediately controlled the spasms, and of itself restored the patient when rapidly sinking under the very liberal use of opium, bark, and wine. Two drachms in twelve or twenty four hours is the largest quantity I have ever found it necessary to give."

Myrrha. *Myrrh.* A gum resin.

A gummy resinous concrete juice, obtained from a shrub growing in the East Indies, but of which we possess no certain account.

The best myrrh is somewhat transparent, of a uniform brownish, or reddish yellow colour; of a slightly pungent, bitter taste; with a strong aromatic, not disagreeable odour, though nauseous to the palate.

In its medicinal effects, this aromatic bitter, when taken internally, is supposed to warm and strengthen the stomach and other viscera; it frequently occasions mild diaphoresis, and, in general, promotes the fluid secretions. Hence it has been used with advantage in cases of debility; in diseases arising from suppression of the urine, or from immoderate discharges, in cachectic habits, and those persons whose lungs and throat are oppressed by viscid phlegm. It is farther believed to resist putrefaction in all parts of the body; on which account it is highly recommended in malignant, putrid, and pestilential fevers;

and in the small pox. For these purposes it should be taken in doses of half a drachm or upwards; and it may also be usefully combined with nitre, cream of tartar, or some other cooling salt. Myrrh is an expectorant, which has been regarded as too stimulating to be employed in pneumonic affections, or in phthisis, but which has been often employed in asthma and chronic catarrh. Its dose is from ten to twenty or thirty grains. The tincture of myrrh is in common use externally as a stimulating application to foul ulcers, and to spongy gums.

MYRTUS PIMENTA. *Pimento Tree.* The fruit, called Jamaica Pepper.

This is a native of Jamaica, and grows in all the wood lands on the north side. The berries are pulled before they are ripe, and dried in the sun. The smell of this spice resembles a mixture of cinnamon, cloves, and nutmegs: its taste approaches to that of cloves, or a mixture of the three foregoing; whence it has received the name of *allspice.*

Pimento is a warm aromatic stimulant, and is much used as a condiment in dressing food. As a medicine it is advantageously substituted for the more costly spices, especially in hospital practice.

NICOTIANA TABACUM. *Tobacco.* The leaves.

The tobacco plant is a native of America, where considerable quantities are annually raised for exportation. The leaves have a strong, disagreeable, narcotic smell, and a very acrid burning taste. The active constituent of tobacco is an essential oil; so active, that small animals are almost instantly killed, when wounded by a needle dipped in it; and a few drops of this oil taken internally have operated as a fatal poison. Hence the pernicious effects, which may result from smoking the leaves of this noxious plant may be easily inferred.*

* The reader who is anxious to see its injurious effects on both body and mind, detailed in an ample manner, is refered to an excellent paper of Dr. Rush, in his Essays, Literary, Moral and Philosophical. Philadelphia, 1798; and to Dr. Waterhouse's Lecture on the evil tendency of tobacco, &c. Cambridge, Nov. 20, 1804.

The effects of tobacco are those of a powerful narcotic. Along with severe nausea and vomiting, it reduces the force of the circulation, and occasions extreme muscular debility, with insensibility and cold sweats. As a diffusible stimulant, the smoke of tobacco, thrown into the intestines, was at one time employed in the recovery of drowned persons, a practice now exploded as pernicious. It is employed with more advantage in ileus and incarcerated hernia, though it requires to be managed with much caution. The watery infusion, of the strength of two drachms of the tobacco to one pound of water, is a more convenient mode of exhibiting it, as an enema. The smoke received into the mouth relieves the pain of toothach by its narcotic power, or by exciting a profuse salivary discharge. Reduced to powder, it proves an excellent errhine and sternutatory, when snuffed up the nostrils. In infusion it is also applied externally for the cure of psora, tinea, and other cutaneous diseases.

In an inaugural dissertation by Dr. Brailsford of South Carolina, (Philadelphia 1799) the author asserts, that the evident operation of tobacco on the system, is that of a *sudorific* and *emetic*, a *cathartic*, and a diuretic. Hence the propriety of its use, in a variety of diseases. In cases of ascites and other dropsical affections, it appears to be an invaluable remedy. As a diuretic it is excelled by few if any of our indigenous plants. Dr. Fowler, by extensive experiments, has proved it to be a *powerful diuretic*, in cases of dropsies and dysuries. He prescribed it in the form of infusion; about eighty drops of which he considers as the average dose for an adult, or to begin with sixty drops, and increase the number by five, eight, or ten at a time, to one hundred; or till by their obvious effects on the system, the proper dose shall be ascertained. The properest times for administering the medicine, are two hours before dinner, and at bed time; it being observed to disagree the most with the stomach, in the morning fasting.

In cases of nephritis calculosa, or gravel, the infusion was given with astonishing effect. In many cases of asthma Dr. Fowler found the infusion to prove a good expectorant, and to afford great relief. The decoction of tobacco exhibited in cases of colic, procured relief almost instantaneously after other medicines had proved ineffectual. One ounce of the infusion, in half a pint of milk or gruel, is a medium dose in the form of injection

for an adult of an ordinary constitution: this is to be repeated, or the strength of it increased, as occasion may require.

In the *iliac passion*, and in *hernia*, both the infusion and smoke of tobacco have been employed in the form of injection with the happiest effects. In *tympanites intestinalis* strong clysters of tobacco infusion have greatly relieved the patients. As a vermifuge it is deserving of being held in high repute, either taken internally, or, according to professor Barton, the leaves are to be pounded with vinegar, and applied in the shape of a poultice to the region of the stomach, or other part of the abdomen. In consequence of this application, worms are often discharged, after powerful anthelmintics have been exhibited internally in vain.

In cases of obstinate constipation of the abdominal viscera, the infusion of this medicine has been administered, and often with immediate relief, by occasioning a speedy expulsion of the obstructed indurated feces. In the tetanus, or lock jaw, injections of this infusion have been used with success; they not only produce evacuations from the bowels, which are generally obstinately constipated, but from their antispasmodic powers, occasion a relaxation of the violent spasms so peculiar in this disease. Dr. James Currie, of Liverpool, has employed with remarkable success, a cataplasm formed chiefly of tobacco, applied to the scrobiculus cordis, about half an hour before the expected accession of the paroxysm, both in epilepsy, and in obstinate intermittents; and in two cases of general convulsion, by means of the decoction in the form of enema, he performed cures altogether surprising and unexpected.

NIGELLA. *Golden-thread. Mouth Root.* (*Cutler.*)

The root.

Golden-thread is a very small plant found in wet swampy situations. The stems are erect and naked. The leaves grow by threes at the termination of the stems and are circular and scolloped. The white solitary blossoms appear in May. The roots appear singular, being thread shaped, running, and of a bright yellow colour. They possess a considerable degree of astringency and bitterness, and have long been employed by the people in the country as a remedy in apthas and can-

kerous sores in the mouths of children with considerable benefit. From the bitter property possessed by these roots they are supposed by some to be useful as a stomachic bitter.

Nitras.

Nitrate is the generic term for secondary compounds which consist of nitric acid, combined with any base.

There are three families of nitrates.

1. Alkaline nitrates;—soluble in water; solubility increased by increase of temperature; crystalizable; forming no precipitate with alkaline carbonates.

2. Earthy nitrates; soluble in water; forming a white precipitate with alkaline carbonates.

3. Metallic nitrates; generally soluble, both in water and in alcohol; decomposable by heat, furnishing nitric oxide gas, and leaving the metal oxidized to a maximum.

Nitras Potassæ. *Nitrate of Potass. Nitre.* Salt Petre.

This salt, consisting of nitric acid and potass, is found ready formed on the surface of the soil in warm climates. In the south of Europe, its production is accelerated by artificial arrangements. Animal and vegetable substances, in a state of decomposition, are mixed with a quantity of carbonate of lime, and exposed to the air, but protected from the rain. After a certain period, the materials are found to contain nitrate of lime and nitrate of potass. These salts are extracted by lixiviation with water; potass is added by which the nitrate of lime is decomposed, and the quantity of nitrate of potash increased; and this salt is purified by repeated solutions and crystalizations. It is also found in several parts of the United States.

During the process by which the nitrate of potass is formed, it appears that the azot of the animal matter combines partly with the oxygen of the atmospheric air, and partly with the oxygen of the animal substances. The resulting compound, the nitric acid, is attracted in part by the lime present, and in part by a quantity of potass, which seems to be likewise formed during the process.

Nitre is of a sharp, bitterish, penetrating taste, followed by a sensation of coldness. When pure, it dissolves in about six times its weight of water, and on

evaporating the latter concretes into transparent crystals. It easily melts in the fire, where it deflagrates with a bright flame, accompanied with a crackling noise, and afterwards deposits a large portion of alkaline earth.

Purified nitre is prescribed with advantage in numerous disorders. Its virtues are those of a refrigerant and diuretic. It is usually given in doses from two or three grains, to a scruple, being a very cooling and resolvent medicine, which, by relaxing the spasmodic rigidity of the vessels, promotes not only the secretion of urine, but at the same time insensible perspiration, in febrile disorders; while it allays thirst and abates heat; though in malignant cases in which the pulse is low, and the patients strength exhausted, it produces contrary effects.

When combined with the Peruvian bark, nitre affords a useful corrective to that drug, in the cure of spreading gangrenes; as it prevents the additional heat which the bark frequently occasions: so that the efficacy of the latter is increased by the antiseptic quality of the former. But this cooling salt should never be administered in cases where the violence of the fever depends on bilious or putrid impurities in the abdomen, and where the patient is subject to hæmorrhagies or fluxes of blood, arising from a vitiated state of the fluids. On the contrary, salt petre will be most beneficially used in acute rheumatisms, inflammatory fevers, and even in those hæmorrhagies arising from congestions of the blood in general, or from a plethoric state.

This powerful salt, when inadvertently taken in too large quantities, is one of the most fatal poisons. There are several attested cases on record, and some recent instances might be added, in which from half to a whole ounce of salt petre has occasioned violent vomiting, convulsions, swelling, and other painful symptoms, in persons who, by mistake, had swallowed it in a dissolved state, instead of glauber, or similar salts. The most proper antidote in such distressing situations, will be a scruple or half a drachm of ipecacuanha, with a teacup full of sweet oil, and a large quantity of warm water to be drunk after it, to promote its operation, as an emetic. It will be necessary also to make use of copious and frequent draughts of mucilaginous decoctions, of marsh mallows, pearl barley, arrow root, &c. after which a gentle opiate will afford the desired relief. For some interesting observations relative to the deleterious properties of salt

petre, the reader is refered to Dr. Mitchell's letter to Dr. Priestly.*

OLEA EUROPÆA. *The Olive Tree.* The fixed oil of the fruit, called olive oil.

The olive tree is a native of the southern parts of Europe, especially Italy, Spain, France and Portugal, where it is cultivated to a very considerable extent, on account of its fruit, from which the sweet or salad oil is extracted; and which also, when pickled, forms an article of food. Olives possess, in their natural state, an acrid, bitter, and extremely disagreeable taste; which, however, is considerably improved when this fruit is pickled. On account of the great quantity of oil they contain, olives, if eaten by persons of delicate habits, are extremely hurtful, especially if taken by way of desert, after a solid or heavy dinner. As an article of food, olive oil is preferable to animal fat; but it ought always to be mild, fresh, and of a sweet taste. It should not however be eaten by persons of weak stomachs; for even in its mildest state, it produces rancidity and acrimony, which are extremely injurious to digestion.

Medicinally considered, olive oil has lately been found an excellent preventive of the plague, when rubbed over the whole body, immediately after the contagion is supposed to have taken place. The oil, when properly applied, and followed by a considerable degree of friction, occasioned a copious sweat over the whole body, by which, it is said, the patients were immediately cured.

Olive oil has also been employed with success as an antidote against the poison occasioned by the bite of serpents, especially that of the rattlesnake. In several cases apparently desperate, when a few spoonfuls of oil had been swallowed, the violent symptoms instantaneously subsided, and cures were soon effected. In gouty patients, sweet oil rubbed into the pained limb, proves a very soothing, safe, and useful application. It is also beneficially employed internally for recent colds, coughs, hoarseness, &c. and as a gentle laxative, it is sometimes given in cases of worms. It is also directed in large quantities to mitigate the action of acrid substances taken into the stomach. Externally it is used in frictions, in gargles, and in clysters; but its principal use is for the composition of ointments and plasters.

* Med. Repos. vol. 3. p. 14.

Orchis Mascula. *Salop.*

The root of this plant, by maceration in water and beating, affords the fecula known by the name of salop. Its qualities and virtues are similar to those of sago. Both of these when boiled in milk or water, with the addition of sugar and wine, form a nutritious jelly, prescribed in diarrhœa and dysentery as a demulcent, and in convalescence as a nutritious article of diet easy of digestion.

Dr. Cutler describes one species of orchis, the production of our own soil, thus,

Lady's Plume. *Female-handed Orchis.* Blossoms in large spikes; white or purplish, or flesh coloured. In wet meadows. August.

Ostrea Edulis. *Oyster.* The shells.

These shell-fish cast their spawn in the month of May, when they become subject to a periodical affection; the male fish, having a black substance in the fin, is black-sick; and the female oyster, from a milky juice in its fin, is said to be white-sick: in June and July they begin to recover, and are in August perfectly sound. They are saltish in the pits, more saline in the beds or layers, and very salt in the sea.

Oysters are esteemed as excellent food, and are eaten both raw, and dressed, in various ways: in a fresh state, however, they are doubtless preferable; for, by cooking, they are in a great measure deprived of their nourishing jelly, and of the salt water which promotes their digestion in the stomach.

The shells of the oyster are composed like all the mother-of-pearl shells, of alternate layers of carbonate of lime, and a thin membranaceous substance, which exactly resembles coagulated albumen, in all its properties. By burning, the membrane is destroyed, and they are converted into lime, which, although very pure, possesses no advantage over that of the mineral kingdom.

Ovis Aries. *The Sheep.* The fat, called mutton suet.

Mutton suet is officinal, for the purpose of giving consistency to ointments and plasters.

Oxalis Acetosella. *Wood Sorrel.* The leaves.

This is a small perennial plant, growing wild in woods, and shady hedges. The leaves contain a considerable quantity of super-oxalate of potass, and have an extremely pleasant acid taste. They possess the same powers with the vegetable acids in general, and an infusion of them makes a very palatable diet drink in ardent fevers; and on being boiled in milk, they form an agreeable whey. But the most easy and efficacious way of preserving these leaves is that of converting them into a conserve with the addition of double their weight of sugar; in which form they are an excellent substitute for lemons, and may be given with advantage in all putrid and other fevers, where antiseptics are indicated.

The leaves of wood sorrel simply bruised, have been applied to scrofulous ulcers with excellent effect, promoting suppuration and granulation in the most satisfactory manner.

The super-oxalate of potass is extracted in large quantities from the leaves of this plant, and sold under the name of *Essential salt of lemons.*

Oxidum Arsenici. *Oxide of Arsenic.*

Arsenic is a heavy, opaque, crystaline substance, of a very singular nature, contained in greater or less quantity in the ore of most metalline bodies, particularly in those of tin and bismuth, and in the mineral, called *cobalt*, from which last most of the *arsenic* brought to us, is extracted in Saxony, by a kind of sublimation. It is in a white crystaline, brilliant, transparent mass, but soon becoming opaque, yet without losing its whiteness. Its true nature is so little known, that chemists have hesitated whether it ought to be ranked among the salts or semi-metals; because it may, by various processes, be made to assume either a saline or metallic state. It is very volatile, and easily oxidated. By oxidation, it is converted into a white powder, which has been considered as an oxide, and lately, perhaps more justly, as an imperfect acid.

Oxide of arsenic is one of the most sudden and violent poisons we are acquainted with. In mines, it causes the destruction of numbers who explore them; and it is fre-

quently the instrument by which victims are sacrificed, either by the hand of wickedness, or imprudence.

The fumes of arsenic are so deleterious to the lungs, that the artist ought to be on his guard, to prevent their being inhaled by the mouth; for if they be mixed and swallowed with the saliva, effects will take place similar to those which follow its introduction into the stomach in a saline state; namely, a sensation of a piercing, gnawing, and burning kind, accompanied with an acute pain in the stomach and intestines, which last are violently contorted; convulsive vomiting; insatiable thirst, from the parched and rough state of the tongue and throat; hiccough, palpitation of the heart, and a deadly oppression of the whole breast, succeed next; the matters ejected by the mouth, as well as the stools, exhibit a black, fœtid, and putrid appearance; at length, with the mortification of the bowels, the pain subsides, and death terminates the sufferings of the patient. Soon after death, livid spots appear on the surface of the body, the nails become blue, and often fall off along with the hair, and the whole body becomes very speedily putrid. When the quantity is so very small as not to prove fatal, tremors, paralysis, and lingering hecties, succeed.

On dissection, the stomach and bowels are found to be inflamed, gangrenous, and corroded, and the blood is fluid.

The antidotes which have been recommended to the poison of arsenic, are various. Vomiting must be immediately excited by giving some brisk emetics, as half a drachm of white vitriol, and after it, plenty of sweet, linseed, or almond oil; large draughts of milk, barley gruel, or warmed beer with a third part of oil, or fresh butter, should be taken.

Mr. Navier prescribes one drachm of sulphurate of potass (liver of sulphur), to be dissolved in a pint of water, which the patient is to drink at several draughts. The sulphur unites with the arsenic and destroys it causticity and effects. According to Hehneman, a solution of white soap is the best remedy. One pound of soap may be dissolved in four pounds of hot water, and a cup full of this solution may be drunk lukewarm every three or four minutes, that the patient may swallow several pounds in the course of two hours. To promote the evacuation of the poison by stool, clysters composed of the preceding liquids, and a third part of castor oil, ought to be speedi-

ly administered, and the whole abdomen fomented with soap water.

Though the most violent of mineral poisons, arsenic, according to Murray, equals, when properly administered, the first medicines in the class of tonics. This is well displayed in its efficacy in the treatment of intermittent fever, the disease in which it has been principally used. The employment of oxide of arsenic is now extended to remitting fever, periodical headach, dropsy, hydrophobia, lepra, elephantiasis, and certainly with safety and success, though its administration will always require to be conducted with the utmost care.

It is employed medicinally under various forms; the arsenical solution introduced by Dr. Fowler, being in general prefered, will be found in its place under the head of preparations.

In the diseases mentioned above, particularly intermittents, it has been found to be a safe and efficacious remedy, by Drs. Fowler, Withering, and other respectable practitioners.

A preparation similar to that directed by Dr. Fowler, and called the white tasteless *ague drops*, has lately been given with singular efficacy in the hooping cough.

The celebrated professor Barton observes, that he has for several years employed the oxide of arsenic in substance, in preference to Dr. Fowler's solution. He commonly gives it in combination with opium. One grain of the arsenic is united to four or eight grains of the opium, and made into a mass with conserve of roses, or honey. This is divided into sixteen pills, of which an adult patient is to take two or three at different periods in the course of the day and night, *especially during the apyrexia*, in intermittent fevers.

Such are the powers of this medicine, that two grains of it are often sufficient to cure an intermittent, that has continued for weeks! For children, he directs that the arsenic be rubbed with honey, and molasses and water, and sometimes with a portion of gum arabic. In this form it is very conveniently given to children by drops; and the quantity of mineral, in each dose, may be estimated with considerable accuracy.

As an external remedy, arsenic has long been known as the basis of the most celebrated *cancer powders;* and it has frequently been resorted to in various forms, with the view of correcting the intolerable fætor attending

cancerous and other foul ulcers, with great success. Arneman recommends an ointment of one drachm of arsenious acid, (oxide of arsenic) the same quantity of sulphur, an ounce of distilled vinegar, and an ounce of white oxide of lead, in cancerous, obstinate, ill-conditioned sores, and in suppurated scrofulous glands. Le Febure washed cancerous sores frequently in the course of the day, with a solution of four grains of oxide of arsenic in two pounds of water.

Arsenic has even been applied in substance, sprinkled upon the ulcer; but this mode of using it is excessively painful, and extremely dangerous. There have been fatal effects produced from its absorption.

The principal thing to be attended to in arsenical applications, is to diminish their activity to a certain degree. They then cause little irritation or pain; but rather excite a gentle degree of inflammation, which causes the diseased parts to slough off; and it has the peculiar advantage of not extending its operation laterally.

No other escharotic possesses equal powers in cancerous affections; it not unfrequently amends the discharge, causes the sore to contract in size, and cases have been related of its having effected a cure.

Mr. Morveait, it is said, has brought arsenic to the state of a true neutral salt, readily soluble in water, by mixing it with equal quantities of nitre, and then submitting them to a chemical process. Mr. Milner, of Cambridge, England, has also produced an arsenical salt of the same nature, which has been employed with the greatest success in that neighbourhood by several practitioners.

The red and yellow arsenics, both native and factitious, have little taste, and are much less virulent in their effects than the white arsenic. Sulphur, which restrains the power of mercury and the antimonial metal, remarkably abates the virulence of this poisonous mineral also. Such of these substances as participate more largely of sulphur, seem to be almost innocent: the factitious red arsenic, and the native orpiments, have been given to dogs in considerable quantity, without being productive of any apparent ill consequences.

Oxidum Plumbi Album. *White Oxide of Lead. Cerusse.*

The white oxide of lead is manufactured in several countries; it is prepared by exposing lead to the vapour of vinegar. To accelerate the oxidizement, the lead is cast into thin plates, which are suspended over a vessel containing vinegar, in a moderately warm place, that the vapour arising from the acid may circulate freely round the plates: a white powder settles in the course of two or three weeks on the surface of the metal, which is in due time removed; and the remains of the plates again exposed to the vapour of vinegar, until they be entirely corroded, and converted into a white calx, when it is called *cerusse*, or white lead.

White oxide of lead is used in surgery; and on account of its cooling, drying, and astringent properties, is of considerable service when sprinkled over running sores, and ulcers. In pharmacy it is used only in the composition of ointments and plasters.

Oxidum Plumbi Rubrum. *Red Oxide of Lead.* Red Lead.

The preparation of red lead is so troublesome and tedious, as scarcely ever to be attempted by the apothecary or chemist. The makers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built for this purpose, and so contrived, that the flame acts upon a large surface of the metal, which is continually changed by the means of iron rakes drawn backwards and forwards, till the fluidity of the lead be destroyed; after which the oxide is only now and then turned.

The red oxide of lead is obtained in the form of a very heavy powder, consisting of minute shining scales, of a bright scarlet, verging towards yellow, especially if triturated.

In medicine red lead is only employed externally; it obtunds the acrimony of humors; mitigates inflammations; and if judiciously applied, is of excellent service in cleansing and healing old ulcers.

Oxidum Plumbi Semivitreum. *Semi-vitrified Oxide of Lead.* Litharge.

If oxidized lead be urged with a hasty fire, it melts into the appearance of oil, and on cooling concretes into litharge. Greatest part of the litharge met with in the shops, is produced in the purification of silver from lead, and the refining of gold and silver by means of this metal. According to the degree of fire and other circumstances, it proves of a pale or deep colour: the first has been commonly called litharge of silver, the other litharge of gold.

The oxides of lead dissolve by heat, in expressed oils; these mixtures are the bases of several officinal plasters and ointments. Lead and its oxides, when undissolved, have no considerable effects as medicines. Dissolved in oils, they are supposed to be (when externally applied) anti-inflammatory and desiccative. Combined with vegetable acids they are remarkably so; and taken internally, prove powerful though dangerous stypties.

Oxidum Zinci Impurum. *Impure Oxide of Zinc.* *Tutty.*

It is moderately hard and ponderous; of a brownish colour, and full of small protuberances on the out side, smooth and yellowish within; some pieces have a blueish cast, from minute globules of zinc in its metallic form.

Tutty is celebrated as an ophthalmic, and frequently employed as such in unguents and collyria.

Papaver Somniferum. *White Poppy.* The capsules and their inspissated juice, called opium.

The white poppy is an annual plant, and is sometimes found wild in Great Britain; but it is probably originally a native of the warmer parts of Asia. The leaves, stalks, and capsules, of the poppy, abound with milky juice, which may be collected in considerable quantity, by slightly wounding them when almost ripe. This juice exposed for a few days to the sun and air, thickens into a stiff tenacious mass, which in fact is opium. It is then worked up into masses, and covered with poppy or tobacco leaves.

A strong decoction of the dried heads, mixed with as much sugar as is sufficient to reduce it to the consistence of a syrup, becomes fit for keeping in a liquid form. It is, however, a very unequal preparation, as the real quantity of opium it contains is very uncertain, and by no means equal to syrup, to which a certain quantity of solution of opium is added. The seeds of the poppy are simply emulsive, and contain none of the narcotic principle. They yield a considerable quantity of oil by expression.

Two kinds of opium are found in commerce, distinguished by the names of Turkey, and East India opium.

Turkey opium is a solid compact substance, possessing a considerable degree of tenacity; when broken, having a shining fracture and uniform appearance; of a dark brown colour, and becoming yellow when reduced to powder; scarcely colouring the saliva when chewed, exciting at first a nauseous bitter taste, which soon becomes acrid, with some degree of warmth; and having a peculiar, heavy disagreeable smell. The best is in flat pieces, and besides the large leaves in which it is enveloped, is covered with the reddish capsules of a species of rumex, probably used in packing it. The round masses which have none of these capsules adhering to them, are evidently inferior in quality. It is bad if it be soft, friable, mixed with any impurities, or have an intensely dark or blackish colour.

East India opium has much less consistence, being sometimes not much thicker than tar, and always ductile. Its colour is much darker; its taste more nauseous, and less bitter; and its smell rather empyreumatic. It is considerably cheaper than Turkish opium, and supposed to be of only half the strength.

Opium is supposed to consist principally of gum and resin, in the proportions of about four and a half of each in twelve parts of the crude opium. The bitterness is said to reside in the gum; the astringency, flavour, and narcotic quality in the resin. It affords a volatile principle; water distilled from it having its nauseous taste and smell, but none of its narcotic quality. It contains also some saline matter, and a substance insoluble either in alcohol or water.

From its analysis may be estimated the effects of different solvents upon it. Alcohol and proof spirit, dissolving its resin, afford tinctures possessing all its virtues.

Water dissolves its gummy part, which is much less active, but a part of the resin is at the same time taken up by the medium of the gum. Wines also afford solutions possessing the virtues of opium. Vinegar dissolves its active matter, but greatly impairs its power.

The attempts made by some pharmaceutists, to obtain a preparation of opium, which should possess only its sedative, without its narcotic effects, only succeeded in so far as they diminished its activity.

The action of opium on the living system, has been the subject of the keenest controversy. Some have asserted that it is a direct sedative, while others have asserted as strongly, that it is a powerful stimulus, and that the sedative effects, which it certainly produces, depend entirely on the previous excitement. We cannot here pretend to give even an abstract of the arguments used by the supporters of each opinion. We regret still more, that the contradictory results of their experiments render it difficult to ascertain even its primary and visible effects.

Opium, when taken into the stomach to such an extent as to have any sensible effect, gives rise to a pleasant serenity of mind, in general proceeding to a certain degree of languor and drowsiness. The action of the sanguiferous system is diminished, the pulse becoming for the most part softer, fuller, and slower than it was before.

By many, on the contrary, it is said, in the first instance at least, to increase the frequency of the pulse, and the heat of the body. It diminishes all the secretions and excretions, except the cuticular discharge, which it frequently augments in a very sensible degree. It excites thirst, and renders the mouth dry and parched.

Opium taken into the stomach in a larger dose, gives rise to confusion of head and vertigo. The powers of all stimulating causes of making impressions on the body are diminished; and even at times, and in situations, when a person would naturally be awake, sleep is irresistibly induced. In still larger doses, it acts in the same manner as the narcotic poisons, giving rise to vertigo, headach, tremors, delirium, and convulsions; and these terminating in a state of stupor, from which the person cannot be roused. This stupor is accompanied with slowness of the pulse, and with stertor in breathing, and the scene is terminated in death, attended with the same appearances as take place in an apoplexy.

From these effects of opium in a state of health, it is not wonderful that recourse should have been had to it in disease, as mitigating pain, inducing sleep, allaying inordinate action, and diminishing morbid sensibility. That these effects result from it, is confirmed by the daily experience of every observer; and as answering one or other of these intentions, most, if not all, of the good consequences derived from it in actual practice are to be explained. If, therefore, by a sedative medicine, we mean an article capable of allaying, assuaging, mitigating, and composing, no substance can have a better title to the appellation of sedative than opium.

Some practitioners are averse to its use in active inflammation; but others have recourse to it in such cases, even at an early period, especially after bloodletting; and where such affections are attended not only with pain and spasm, but with watchfulness and cough, it is often productive of the greatest benefit. Opium combined with calomel has of late been extensively employed in every form of active inflammation, and with the greatest success. It is found also to be of very great service in allaying the pain and preventing the symptomatic fever liable to be induced by wounds, fractures, burns, or similar accidents.

In intermittents, it is said to have been used with good effect before the fit in the cold stage, in the hot stage, and during the interval. Given even in the hot stage, it has been observed to allay the heat, thirst, headach, and delirium, to induce sweat and sleep, to cure the disease with less bark, and without leaving abdominal obstructions or dropsy.

It is often of very great service in fevers of the typhoid type, when patients are distressed with watchfulness or diarrhœa. But where these or similar circumstances do not indicate its use, it is often distressing to patients by augmenting thirst and constipation.

In small pox, when the convulsions before eruption are frequent and considerable, opium is liberally used. It is likewise given from the fifth day onwards; and is found to allay the pain of suppuration, to promote the ptyalism, and to be otherwise useful.

In dysentery, after the use of gentle laxatives, or along with them, opium, independent of any effect it may have on the fever, is of consequence in allaying the tormina and tenesmus, and in obviating that laxity of bowels which so frequently remains after that disease.

In diarrhœa, the disease itself generally carries off any acrimony that may be a cause, and then opium is used with great effect. Even in the worst symptomatic cases, it seldom fails to alleviate.

In cholera and pyrosis, it is almost the only thing trusted to.

In colic, it is employed with laxatives; and no doubt often prevents ileus and inflammation, by relieving the spasm. Even in ileus and incarcerated hernia, it is often found to allay the vomiting, the spasms, the pain, and sometimes to diminish the inflammation, and prevent the gangrene of the strangulated gut.

It is given to allay the pain and favour the descent of calculi, and to relieve in jaundice and dysuria proceeding from spasm.

It is of acknowledged use in the different species of tetanus; affords relief to the various spasmodic symptoms of dyspepsia, hysteria, hypochondriasis, asthma, rabies canina, &c. and has been found useful in some kinds of epilepsy.

In syphilis it is only useful in combating symptoms, and in counteracting the effects resulting from the improper use of mercury, for it possesses no power of overcoming the venereal virus.

It is found useful in certain cases of threatened abortion and lingering delivery, in convulsions during parturition, and in the after pains and excessive flooding.

The only form perhaps necessary for opium is that of pill; and as it is so soluble in every menstruum, there seems the less occasion for the addition of either gum or soap. It is more apt to sit on the stomach in this than any liquid form, but requires rather more time to produce its effects. The administration of opium to the unaccustomed, is sometimes very difficult. The requisite quantity of opium is wonderfully different in different persons, and in different states of the same person. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another; and a dose that might prove fatal in cholera or colic, would not be perceptible in many cases of tetanus or mania. The lowest fatal dose to the unaccustomed as mentioned by authors, seems to be four grains; but a dangerous dose is so apt to puke, that it has seldom time to occasion death. When given in too small a dose, it is apt to produce disturbed sleep, and other disagreeable consequences;

and with some constitutions it seems not to agree in any dose or form. Often, on the other hand, from a small dose, sound sleep, and alleviation of pain will be produced, while a larger one gives rise to vertigo and delirium. Some prefer the repetition of small doses, others the giving of a full dose at once. In some it seems not to have its proper effect till after a considerable time. The soporific operation of a moderate dose is supposed to last in general about eight hours from the time of taking it.

It is often given to promote healthy suppuration, and is a principal remedy in arresting the progress of certain kinds of gangrene.

Externally applied opium alleviates pain, and relieves spasmodic action. Hence the utility of it in colic, tetanus, toothach, &c. In the form of enema, it is of singular efficacy in tenesmus, and it is employed under the same form in other diseases, where its administration by the mouth is inconvenient or impracticable.

In his medical reports on the effect of water, Dr. James Currie, relates a case of tetanus, and general convulsion, in which the patient first took a grain of opium every other hour; afterwards a grain every hour, and at last two grains every hour. But being no longer able to swallow pills, the tincture (liquid laudanum) was directed, of which in twenty-four hours he took two and a half ounces without sleep or alleviation of pain. The dose being increased in the next twenty-six hours, he swallowed five and a half ounces of the laudanum, a quantity, which at that time, says the doctor, was unexampled. He lay now in a state of torpor. The rigidity of the spasms was indeed much lessened; and the general convulsions nearly gone; but the debility was extreme; a complete hemiplegia had supervened; the patient's eyes were fixed, and his speech faultering and unintelligible. It seemed no longer safe to continue the laudanum, and the patient was afterwards cured by the cold bath and other remedies.

Dr. Joshua Fisher, in his interesting discourse read before the Massachusetts Medical Society, asserts, that a young lady aged seventeen, being seized with excruciating spasms, the consequence of a rupture of the sartorius muscle, took twelve grains of opium every ten minutes till she had taken seventy-two grains. This quantity removed the spasms, produced a comatose insensibility, slow, stertorous breathing, and a slow full pulse. In

eight hours the spasms returned, and the opium was given as before. In this manner the opium was repeated at intervals of eight hours, for three days, when the spasms ceased and she recovered. During this period of three days, she took nearly eleven drachms of excellent opium, and not a grain more than was absolutely necessary.

In the colica pictonum, or Devonshire colic, Dr. Fisher administers opium in doses from fifteen to forty grains; and has not for many years past, seen a single case of this distressing disease, which has not yielded to its efficacy in about an hour.

This experienced physician has prescribed opium in large doses in cases of cholera with equal success. A gentleman, of about sixty-five years, was seized with this disease in so violent a manner, that, in a few hours after the attack, every symptom indicated his speedy dissolution. As soon as practicable sixty grains of opium were given, ten of which were returned by vomiting. The quantity retained, soon removed every distressing symptom: gradually and with difficulty he recovered his strength.

The soporific effects of opium may be checked, if a proper quantity of the vegetable acid be taken with, or immediately after it. Thus, if one ounce of pure lemon juice, or twice that quantity of good vinegar, be added to every grain of opium, or to twenty-five drops of laudanum, such a compound will produce a very different effect. Instead of stupifying the head, and producing troublesome costiveness, it will not only relieve the bowels, but also occasion a degree of cheerfulness, never attainable by the use of opium alone, and afterwards induce a composed and refreshing sleep.

It is a melancholy consideration, that this excellent, kind assuager of our bodily pains and mental distress, is frequently resorted to for the horrid purpose of self-destruction. The alarming symptoms induced by it, are, vomiting, delirium, stupor, deep and difficult breathing, convulsions, and death. The remedies are in the first instance, powerful emetics of sulphate of zinc; twenty grains of which should be given immediately, in a glass of warm water, and repeated every ten minutes, until copious vomitings are excited. Warm water is then to be freely given, together with a smart purgative of rhubarb or jalap, joined with a few grains of potass. These

should be succeeded with water-gruel or butter-milk, sour whey, and particularly the vegetable acids, or strong coffee, which last appears to be the most effectual antidote.

The principal object to be kept in view, according to Dr. Seaman, of New-York, is, to produce such a degree of irritation, as may counteract the narcotic effects of this deleterious drug. Hence it is very useful to stimulate the nostrils with spirits of hartshorn, and to apply friction with salt over the whole body. When the symptoms of apoplexy have come on, the remedy is *copious bleeding*. This has been used in four cases by Dr. Rush, who remarks, that it should never be prescribed, until great morbid action, or the suffocation of action from the excess of stimulus, (manifested chiefly in the depressed state of the pulse,) have taken place.

PHYSETER MACROCEPHALUS. *Spermaceti Whale.* The matter found within the cranium, called spermaceti.

Spermaceti is a fatty matter obtained from the head of the particular species of whale above mentioned. It is purified by melting and boiling with an alkaline solution. It is then in white flakes, is unctuous and friable, and has neither taste nor smell. Its chemical properties are the same as those of the expressed oils and fats, except that it does not easily unite with the alkalis.

Its medicinal virtues are those of a mild demulcent, and as such is given in catarrh and gonorrhœa, mixed with sugar, or diffused in water by the medium of the yolk of an egg.

PHYTOLACCA DECANDRA. *American Nightshade. Garget.* The leaves, berries, and root.

This is one of the most common North American plants, well known in New-England by the name of cunicum, skoke, or coakum. In the southern states it is called pokeweed. It has a thick, fleshy, perennial root as large as parsnips. From this rise many purplish herbaceous stalks, about an inch thick, and six or seven feet long; which break into many branches irregularly set with large, oval, sharp pointed leaves, supported on short foot stalks. These are, at first, of a fresh green colour, but as they grow old they turn reddish. At the joints

and divisions of the branches, come forth long bunches of small bluish coloured flowers, consisting of five concave petals each, surrounding ten stamina and ten stiles. These are succeeded by round depressed berries, having ten cells, each of which contains a single smooth seed. The young stems when boiled are as good as asparagus, but when old they are to be used with caution, being a plant of great activity, operating both as an emetic and cathartic. A tincture of the ripe berries in brandy or wine, is a popular remedy for rheumatism and similar affections; and it may be given with safety and advantage in all cases where guaiacum is proper. The extract of the juice of the ripe berries has been employed in some cases of scrofula; and cancerous ulcers have been greatly benefited by its application. The juice of the leaves, however, is said to be more effectual.

Dr. Shultz in his ingenious inaugural dissertation on this subject, observes, that "scabies and herpes have been often removed by it. In these cases, a solution of the extract in water is generally substituted where the expressed juice cannot be had. In rheumatisms, the whole substance of this plant has at different times been of essential service; although the berries have generally been prefered. In those rheumatic affections which sometimes occur to syphilitic patients, its virtue far exceeds that of opium; and it seems more valuable than guaiacum, especially when combined with mercury.

"For medicinal purposes, the leaves should be gathered about July, when the foot stalks begin to assume a reddish colour, dried in the shade, and powdered for use. An extract may easily be obtained from the leaves when gathered at this period, by gently evaporating their expressed juice to a proper consistence."

A tincture may be made by dissolving either the extract or the leaves, in their green or dry state, in common brandy, or in the spirit distilled from the berries.

An ointment is also made by powdering the dried leaves, and mixing them well with hogs lard, or simple cerate: or by boiling some hogs lard and bees wax with fresh leaves, and straining the mass. The proper time for gathering the berries in this climate is in October, when they become soft and ripe, and are of a blackish colour.

The root is to be gathered about November or December, when the stalks of the plant are perfectly dead, and to facilitate drying, it should previously be divided into

small pieces. An extract may be made from the root in the same manner as from the leaves or berries.

It is affirmed by a physician of reputation and experience, that the leaves of phytolacca decandra have been found an admirable remedy in hæmorrhois. A strong infusion is given internally, and if it does not speedily relieve, the same infusion is to be injected into the rectum. This method will in general effect a perfect cure.

According to the experience of Drs. Jones and Kollock, of Savannah, this plant may be relied on as an effectual remedy for syphilis in its various stages, even without the aid of mercury; and they employ it with much confidence, both internally and externally in rheumatisms, and in cutaneous eruptions. One ounce of the dried root infused in a pint of wine, and given to the quantity of two spoonfuls, operates kindly as an emetic. The roots are sometimes applied to the hands and feet of patients in ardent fevers. Many country people use the extract with great confidence in its efficacy in discussing indolent tumors, and in healing various kinds of ulcers. It is found to operate as a mild vegetable caustic, cleansing and healing foul ulcers better than most other remedies of that class. In three cases of apparent *fistula lachrymalis*, it is reputed to have performed cures, by being applied to the tumors twice a day for two or three weeks. This root has also been employed in compounds as an article of dying.

Pimpinella Anisum. *Anise.* The seeds.

Anise is an annual umbelliferous plant, growing naturally in Crete, Syria, and other places of the East.

The seeds of anise have an aromatic odour, and a warm taste, with a share of sweetness. They afford by distillation with water, a considerable quantity of an essential oil, having a strong flavour, and a sweet taste without pungency.

Anise is used as a good carminative in dyspepsia, and in the flatulence to which children are subject. A drachm or two of the seeds may be taken, or a few drops of the oil rubbed with sugar.—[See volatile oils.]

PINUS ABIES. *Common Spruce Fir.* The resin which concretes spontaneously, called Burgundy pitch.

This substance is obtained by exudation, from incisions in the trunk of the tree. It is boiled with a small quantity of water; is strained; and when cold, forms a concrete resinous matter. This, spread upon leather, and applied to the skin, excites a slight degree of inflammation, and exudation of serous fluid.

In obstinate coughs, affections of the lungs, and other internal complaints, plasters of this resin, by acting as a topical stimulus, are frequently found of considerable service.

PINUS BALSAMEA. *Balsam Fir. Hemlock Fir.* The liquid resin, called balsam of Canada.

This balsam exudes spontaneously from the trunk of the tree. It is of a light yellow colour, tenacious, and inflammable. By keeping, it becomes thicker; its smell is agreeable; its taste pungent. It is soluble in alcohol and oils, and affords an essential oil by distillation.

The medicinal virtues of this balsam seem to be the same as those of copaiba, and it is used for the same purposes. Its dose is from thirty to fifty drops.

PINUS LARIX. *The Larch tree.* The liquid resin, called Venice turpentine; and volatile oil, called oil of turpentine.

This balsam exudes spontaneously, and in greater abundance from incisions in the tree. It is thick and tenacious, pellucid, of a yellowish colour, has a pleasant smell, and a bitterish, pungent taste. By distillation, with the addition of a small quantity of water, to prevent the temperature from rising too high, it affords a large quantity of essential oil (oleum terebinthinæ, oil of turpentine); the residuum being a resin nearly insipid, (common white, or yellow resin.)

Venice turpentine derives all its virtues from its essential oil, and it is this oil that is generally used in medicine. It is a powerful stimulant, directed more particularly in its action to the urinary passages. It has been employed in gleet, and in chronic rheumatism, especially in that

form of it termed sciatica and lumbago, in a dose of from five to twelve drops, gradually increased, generally mixed with a quantity of honey, by which its pungency is covered. It is apt, however, to induce violent symptoms. Externally, it is applied as a stimulant to parts affected with cramp and rheumatism. Oil of turpentine has of late been successfully applied to scalds. When seasonably applied to the scalded part, the pain has frequently been removed in an hour, and blisters effectually prevented. The turpentine itself is sometimes used internally for the same purposes as its oil. The white resin is somewhat stimulant and diuretic; but it is only employed in the composition of ointments and plasters, which it renders more adhesive, and perhaps more stimulating. Oil of turpentine has also been found to possess styptic powers in restraining epistaxis when applied up the nostrils.

The rectified oil of turpentine has lately been administered by Dr. J. B. Brown with complete success in the case of a lad aged sixteen years afflicted for six years with tænia. This lad swallowed the oil undiluted in a dose of one ounce, and once in a dose of one ounce and half, and took three doses in sixteen hours. It operated powerfully as a cathartic and he discharged upwards of twenty feet of the tænia. Dr. B. is convinced that the oil of turpentine rectified, may be given to the extent of two or three ounces with perfect safety, but prefers half ounce doses at short intervals.

N. Eng. Med. Journal, No. 3, Vol. 1. p. 269.

Pinus Sylvestris. *Scotch Fir.* The empyreumatic resin, called tar; and the liquid resin, called common turpentine.

Tar is a thick, black, unctuous matter, extracted from the wood of the pinus sylvestris, by combustion in a close smothering heat. By long boiling, tar is deprived of its volatile parts, and converted into pitch. Tar is a mixture of resin, empyreumatic oil, charcoal, and acetous acid. It was formerly in great repute as a medicine, both in its original state, and also in infusion with water.

It has been greatly recommended by bishop Berkley, in the murrain of cattle; and likewise in cold and phlegmatic habits of mankind; as it not only raises the pulse, and accelerates the circulation, but, at the same time,

exhilarates the animal spirits. At present, however, tar water is seldom employed, though its external application proves to be an excellent remedy for the stings of wasps and bees. Tar is applied in the form of ointment, in tinea capitis, and some other cutaneous diseases.

The common turpentine obtained from this tree, is rarely given internally; its principal use is in plasters and ointments among farriers, and for the distillation of essential oil.

A fluid extract, prepared by decoction from the twigs or cones of the pinus sylvestris, is the usual well known *essence of spruce*, which fermented with molasses, forms the fashionable beverage of spruce beer.

PIPER NIGRUM. *Black Pepper.* The fruit.

This tree is a native of the East Indies, where the fruit or berries in their unripe state, are gathered in the month of October, and dried, by being exposed to the sun for seven or eight days. Its smell is aromatic: its taste pungent. Both are extracted completely by water; partially by alcohol.

Pepper, from its stimulating and aromatic qualities, is employed, to promote digestion, to relieve nausea, to check vomiting, or to remove singultus, and as a remedy in retrocedent gout and paralysis. Its dose is ten or fifteen grains. Its infusion has been used as a gargle, in relaxation of the uvula.

White pepper is the ripe berries of the same vegetable, freed from the outer covering, and dried in the sun. It is less pungent than the black.

PIPER LONGUM. *Long Pepper.* The fruit.

This berry is obtained from another species of the same genus of trees. It is about half an inch in length, cylindrical, and indented on the surface. In flavour, taste, and other qualities, it is similar to the black pepper, and may be used for the same purposes.

PLANTAGO. *Plantain.* The leaves.

Great plantain is perennial, common in fields and by the road sides, flowering from June to August. The country people apply the bruised leaves of this vegetable

to slight wounds, and inflamed sores and swellings with a favourable effect. It has been recorded in a Virginia gazette, 1802, that a gentleman was bitten above the knee by a venomous spider. In a few minutes he observed a pain shooting upwards from the spot, which presently reached his heart. A quantity of plantain leaf was immediately procured, and the juice being bruised out was swallowed largely, by which the progress of the poison was stopt, and finally a cure was effected. Some oil was also swallowed, but the plantain leaf had the entire credit of his recovery, and but for this remedy, he said he could not have survived an hour longer.

Plumbum. *Lead.*

This is one of the imperfect metals, of a dull white, inclining to a blue colour: and, though the least ductile and sonorous, it is the heaviest of metallic bodies, excepting mercury, gold, and platina. Lead is found in various countries; but it abounds in England. It is obtained by various processes, from the ores dug from the earth. In its metallic form, it is scarcely an officinal article, and its different oxides are purchased from the manufacturers, and never prepared by the apothecary.

Its effects on the body are emaciation, violent colics, paralysis, tremors, and contractions of the limbs; as they generally come on gradually, the cause is sometimes overlooked, until it be too late. Poisoning from lead is occasioned, either from liquors becoming impregnated with it, by being improperly kept in vessels lined with that metal, or to which lead has been criminally added to correct its acidity; or among manufacturers, who work much with lead, as painters and plumbers, and who are not sufficiently attentive to avoid swallowing it. The only effectual antidotes to this insidious poison, are antimonial emetics; and after them, the internal use of liver of sulphur, together with vegetable oils, both internally and externally, should be liberally continued.

For the medicinal virtues of lead, see its several preparations.

Podophyllum Peltatum. *May Apple. Mandrake.*

The root.

This plant is very common throughout North America. The fruit is esculent, and, by many, thought delicious.

The leaves are poisonous. The root is an excellent purgative in doses of twenty grains. It is most advantageously used in combination with calomel, or crystals of tartar. The root, also, often operates as an athelmintic, and as such, it is used by the Cherokee and other Southern Indians.

The best time of gathering the May apple, for medical purposes, is in autumn, when the leaves have turned yellow, and are about falling off. The Indians dry it in the shade, and powder it for use.

POLYGALA SENEGA. *Seneka. Rattle Snake Root.* The root.

Seneka is a perennial plant, which abounds in nearly all the United States, particularly in Virginia and Pennsylvania. This root is usually about the thickness of the little finger, variously bent, and contorted, and appears as if composed of joints, whence it is supposed to resemble the tail of the animal whose name it bears; a kind of membranous margin runs on each side, the whole length of the root.

This root was first introduced into use in 1739, by Dr. Tennent, of Virginia, who wrote a pamphlet on the subject, and highly extolled it as a remedy for many complaints, and particularly, as a specific for the cure of the bite of the rattle-snake. It is an active stimulus, and increases the force of the circulation, especially of the pulmonary vessels. It has therefore been found useful in typhoid inflammation of the lungs, but it is apt to disorder the stomach, and to induce diarrhœa. Some have likewise employed this root in hydropic cases, and not without success.

There are examples of its occasioning a plentiful discharge by stool, urine, and perspiration; and by this means removing the disease, after the common diuretics and hydragogues had failed.

It sometimes induces salivation, and it possesses diuretic, emetic, cathartic, expectorant, and diaphoretic powers. Dr. Archer, of Maryland, discovered the great utility of seneka snake-root, as a remedy for that fatal disease, the *croup*, and speaks with confidence as to the general good effects produced by it. The decoction of the root is the manner in which he generally gives it; the strength must be determined by the physician; it must be

so strong, as to act sensibly on his own mouth and throat, in exciting coughing, &c. for in this disease, the larynx (mouth of the wind pipe) in a manner loses its natural sensibility. Half an ounce of the root of seneka, bruised, and simmered in a close vessel, in half a pint of water, until reduced to four ounces, will, probably, in most cases be sufficiently strong. A tea spoonful of this to be given every hour or half hour, as the urgency of the symptoms shall demand; and during these intervals, a few drops occasionally, to keep up a sensible action of the medicine, in the mouth and throat, until it act as an emetic and cathartic; then repeated in small quantities, and so frequently as to keep up a constant stimulus in the same. By these means, in the course of two, four, six, or eight hours, a membrane is often times discharged by the mouth, one, two, and often three inches in length; sometimes it is swallowed and voided by stool.

Patients who use the medicine should not be permitted to drink any thing whatever, for some minutes after each dose. The reason must be obvious to all. The powder has lately been used by Drs. Archer and Son, in doses of four or five grains, mixed with a little water, with effects equally as pleasing as the decoction, and more so, unless the latter have been carefully prepared. It should be remarked that this powerful stimulant cannot with safety be exhibited during the inflammatory stage of croup. It is in the third or last stage only, it has been found extremely useful in exciting the vessels of the trachea and lungs to a powerful excretion.

Seneka has been usefully employed in the decline of pleurisies and catarrhs, to promote expectoration. In suppressed coughs of aged persons, and in asthma, it is doubtless useful; a gentle and constant stimulus on the throat should be kept up in these diseases. It has also been exhibited as a powerful remedy in cases of female obstructions. Dr. Chapman of Philadelphia has found it of great utility in obstinate amenorrhœa when given in decoction prepared by adding an ounce of the root to a pint of boiling water, which is slowly reduced by simmering to the quantity of one third. Four ounces of the decoction is to be taken during the day, increasing it when the menstrual effort is expected, as far as the stomach will allow. If this excite nausea, he adds aromatics. To prevent disgust, it is omitted a week or two in the intervals of the menstrual periods. The polygala

sanguinea, a new species discovered at Savannah, has been used as a substitute for the polygala seneka.

POLYGONUM BISTORTA. *Great Bistort. Snake Weed.* The root.

This plant is perennial, and grows wild in moist meadows in several parts of Great Britain. The root is about the thickness of the little finger, of a blackish brown colour on the outside, and reddish within: it is writhed or bent vermicularly (whence the name of the plant) with a joint at each bending, and full of bushy fibres; the root of the species here mentioned, has, for the most part, only one or two bendings; others, three or more. All the parts of bistort have a rough austere taste, particularly the root, which is one of the strongest of the vegetable astringents.

The root of bistort is employed in all kinds of immoderate hæmorrhagies, and other fluxes, both internally and externally, where astringency is the only indication. It is certainly a very powerful styptic, and is to be looked on simply as such. To the sudorific, anti-pestilential, and other virtues attributed to it, it has no other claim but in consequence of its astringency, and of the antiseptic power which it has in common with other vegetable stypties. The largest dose of the root in powder, is one drachm.

POLYPODIUM FILIX MAS. *Male Fern.* The root.

This fern is perennial, and grows in great abundance in almost every part of Britain, where the ground is not cultivated. The root when chewed, is somewhat mucilaginous and sweet, and afterwards astringent and bitter.

The vermifuge powers of fern, are well known. It appears to be particularly active in expelling the tape worm. Dr. G. Jones relates the case of a lady in New York, who after taking many worm medicines, with partial good effects, drank a decoction of fern in water, (a pint per day) until some gallons were taken, when a dose of castor oil brought away the remnant of the worm, measuring forty-five feet.

The fern is the famous remedy of Madame Nuffer of Switzerland, for the tape worm. She acquired the knowledge of the remedy from her husband, who was a surgeon.

and obtained a great price for the secret from Louis 15th of France, by whose order it was published.

The powdered plant was generally preferred by Mad. N. and may be given in doses of from sixty grains to two drachms.

PRINOS VERTICILLATUS. *Winter Berry. Black Alder.*
The bark and berries.

This is a very common shrub in many parts of the United States, and grows in the greatest perfection in swamps and marshy places. The bark is manifestly astringent. It is likewise considerably bitter, and pungent.

The berries, which are of a fine red colour, greatly partake of the bitter quality; and, if infused in wine or brandy, might be advantageously employed in cases where bitter tinctures are exhibited. The bark has been used as a substitute for the Peruvian bark, in intermittents and other diseases, both in substance and decoction. It is supposed to be chiefly useful in cases of great debility unaccompanied with fever, as a corroborant in anasarcous and other dropsies, and as a tonic in cases of incipient sphacelus or gangrene. It is both given internally, and employed externally as a wash. On many occasions, it appears to be more useful than the Peruvian bark. Professor Barton says, it ought to have a place in the shops, and in the pharmacopœia of this country, when such a desideratum shall be supplied. Dr. Mease observes, (Philadelphia Medical Museum, vol. 2.) it is useful in mortification, united with the root of sassafras, in decoction, &c. Care must be taken to distinguish our prinos from the swamp alder or candle alder.

PRUNUS CERASUS VIRGINIANA. *Wild Cherry Tree.*
The bark of both the tree and root.

The common wild cherry tree is often found in woods and hedges and is associated with the trees of the forest, growing to the height of forty or more feet and of a very large size. It is probably produced from the stones of the garden varieties dropped by birds. The timber is capable of receiving a fine polish, resembling mahogany, and is used by turners and cabinet makers, for many purposes. The gum which exudes from the tree is said to be equal to gum arabic. This tree produces in Au-

tumn a small bitter cherry, black when quite ripe, which serves for food for birds who frequently become intoxicated from eating them. They are also infused in brandy by the country people on account of the pleasant aromatic flavour which they impart to the liquor. The bark of the wild cherry tree is powerfully tonic, and has been frequently substituted for the Peruvian bark, with great success. It is slightly narcotic, and commonly produces drowsiness in those who take it. From the experiments of Mr. C. Morris of Virginia, (Inaug. Diss. 1812, Phila.) it appeared that the bark of the root was more powerful than the bark of the trunk. It has been very useful in dyspepsia and in consumption of the lungs. The Indians it is said, use the bark in the cure of syphilis. Very excellent effects have been produced by washing ill conditioned ulcers with a decoction of the bark, and the same has proved anthelmintic. The leaves of this tree are poisonous to certain animals. While this valuable tree abounds in the United States, we act unwisely, says Dr. Mease, in sending thousands of dollars out of the country for the Peruvian bark.

Cherries that are sub-acid are, according to Dr. Willich, an excellent article of domestic medicine in the true scurvy, in putrid fevers, and the dysentery; as likewise to those persons, who are liable to obstructions in the alimentary canal. Nor will they be found less salutary to constitutions whose bile is vitiated, whose stomach is troubled with foul eructations, and who are afflicted with an offensive breath: all such persons should eat them freely, particularly on an empty stomach. For similar reasons, *dried cherries* form an excellent article of diet, in acute and inflammatory disorders: where they should be used both in substance and in decoctions, which are equally cooling and antiseptic.

PRUNUS DOMESTICA. *The French Prune Tree. Plum Tree.* The fruit, called French prunes.

Numerous varieties of prunes or plum tree, are cultivated by gardeners, the fruit of which, when dried, are called prunes. Great quantities of the dried fruit are imported from the continent of Europe, but the French prunes are thought the best.

They contain much mucilaginous and saccharine matter, and their medical effects are, to abate heat, and gen-

tly loosen the belly, which they perform by lubricating the passages, and softening the excrement. They are of considerable service in costiveness, accompanied with heat or irritation, which the more stimulating cathartics would tend to aggravate. Where prunes are not of themselves sufficient, their action may be promoted by joining with them a little rhubarb, or the like; to which may be added some carminative ingredient, to prevent their occasioning flatulency.

PRUNUS LAURO CERASUS. *Cherry Tree Laurel.* The leaves.

An exotic narcotic plant, not cultivated among us, but preserved in some hot houses and botanic gardens as a curiosity. The leaves have an odour slightly fragrant; their taste is extremely bitter. They possess a highly narcotic quality, which is extracted by infusion in alcohol or water, and is even brought over by distillation in the state of an essential oil, which the water partly dissolves. And the very singular fact has been established, that the volatile principle in which the narcotic quality of this plant resides is the prussic acid. It had often been observed, that the odour of this acid is similar to that of the cherry-laurel, peach blossom, and bitter almond. Bohn found, that the distilled water of the bitter almond contained prussic acid. Schroeder discovered it in the distilled water of the peach blossom and cherry-laurel, prussiate of potass being obtained by distilling them from the alkali; and Bucholz succeeded in separating the prussic acid from the essential oil of the cherry laurel, by agitation with an alkaline solution. This acid in its pure state has been further found to be highly narcotic; and the narcotic power of all these plants no doubt depends on it.

The distilled water of the cherry laurel has long been known as a poison to animals, and its effects are those of a pure narcotic. It has not, says Mr. Murray, been employed in medicine, but a cataplasm prepared from the leaves has been used as an anodyne application to painful tumors and ulcers.

Cherry-laurel has ever been considered as a poison of the most deleterious energy, but it is now known, it may be administered internally with perfect safety. In the few instances of its trial it has been found to give tone to

the stomach, increase the appetite, and to exhilarate. Dr. Mayer, of Naples, gives the distilled water of laurel for the cure of virulent gonorrhœa, and by his advice an American captain affirms, that he cured thirty sailors by this medicine alone. It appears to retard the pulse and produce some sedative effects. It has been found serviceable in phthisis pulmonalis on a few trials. Professor Wurzer, of Bonn, gave fifty drops of the laurel water three times in a day, which was very efficacious in hypochondriac and nervous complaints. He finds the laurel water diminishes the too great irritability of the heart and muscular fibre, and augments, at the same time, the action of the absorbent vessels. It is recommended by some German authors in hydrophobia. It may be given in saturated tincture, a few drops cautiously increased until some effect be observable.

PTEROCARPUS SANTOLINUS. *Red Saunders.* The wood.

This is a wood brought from the East Indies in large billets. The best kind is externally of a dull red, or nearly blackish colour, internally brown red; being of a compact texture, and possessing neither a peculiar smell nor taste. Red saunders is chiefly employed as a colouring drug, in the compound tincture of lavender; there is scarcely any other oil to which it communicates its tinge. It communicates a deep red to rectified spirit, but gives no tinge to aqueous liquors.

QUASSIA EXCELSA. *Quassia.* The wood, bark, and root.

The Quassia tree is a native of the West Indies, and of South America. Quassia derives its name from a negro named Quassi, who employed it with uncommon success as a secret remedy, in the malignant epidemic fevers which frequently prevail at Surrinam. The root, wood, and bark of this tree, are all employed in medicine; but the latter, having a greater degree of bitterness, is more efficacious.

Quassia possesses no peculiar odour, but is one of the most intense, durable, pure bitters known. Its infusion, decoction, and tincture, are almost equally bitter, and yellowish, and are not blackened by chalybeates. It is an excellent tonic, antiseptic, and febrifuge: being one of the least heating drugs, it is found very serviceable in

exciting appetite for food; expelling flatulency; assisting digestion; and particularly in removing costiveness, when produced by weakness of the intestines, such as is consequent to sedentary occupations.

Dr. Lettsom prescribed it with advantage, in cases of debility after febrile affections; in dyspepsia, arising from intoxication; and in diarrhœa; but he directed it with the greatest success, when combined with some absorbent in the hysteric atony of females. It has been exhibited in intermittent, and bilious fevers, lienteria, cachexy, dropsies, leucorrhœa, and gout.

It may be given, either in infusion, or in pills composed of the watery extract; the former preparation, however, is generally prefered, in proportion of three or four drachms of the wood, to twelve ounces of water; which is to be taken in doses of one, or two table spoonfuls, frequently repeated.

Quassia Simarouba. *Mountain Damson.* The bark.

This tree grows in Guiana, and in Jamaica. The bark of the root of this tree is brought to us, some feet long, and some inches in breadth, folded lengthwise. It is light, fibrous, very tough; of a pale yellow on the inside; darker coloured, rough, scaly, and warted on the outside; has little smell, and a bitter, not disagreeable taste. It imparts its bitterness to alcohol and water.

It has been much celebrated in obstinate diarrhœa, dysentery, anorexia, indigestion, lienteria, and intermittent fevers, but it is doubtful whether it is better than other bitters. It is given in powder, in doses of half, or a whole drachm; but its best form is in decoction.

Quercus Robur. *Oak.* The bark.

The bark of this valuable tree, is a strong astringent, and possesses tonic and antiseptic virtues. A chemical analysis of the white oak bark, as made by Mr. Davy, affords from one hundred and eighty grains of the inner bark in substance, seventy two grains of pure tannin (that remarkable vegetable principle, the common and general source of the astringent and antiseptic properties). In every astringent bark, says Mr. Davy, the interior white bark contains the largest quantity of tannin.

White oak bark exceeds in astringency the Peruvian

bark, and falls but little, if any short of it, in its tonic powers. Hence, we have a valuable domestic substitute for Peruvian bark, which is successfully employed in hæmorrhagies, alvine fluxes, and other preternatural or immoderate secretions. On account of the great difficulty in reducing it to a sufficiently fine powder, it is most commonly given in decoction.

Dr. Rousseau, in a communication published in the Philadelphia Medical Museum, vol. 2. has mentioned the efficacy of the black oak bark in intermittents, and it appears to be well worthy the attention of physicians. The powder, as prepared by Mr. Benger, is of the most extreme degree of fineness.

The bark of the Spanish oak, *quercus rubra montana, red oak of the mountain*, Dr. Barton has used in a case of gangrene of the foot, with such success, that he thinks it equalled in power the best Peruvian bark. He gave it in decoction in very large quantities, and the affected part was constantly kept wet with the same decoction, or with a poultice made of bread and milk with the bark.

The medicinal virtues of the bark of Spanish oak, are probably, in no respect materially different, from those of the bark of the common white oak of New England. Debilitated patients, whose stomachs cannot retain this medicine, may experience the happiest effects from bathing twice or thrice a day in a strong decoction of the oak barks, about luke warm. It is particularly serviceable in the last stage of fevers.

Quercus Cerris. *Oriental Oak.* The nest of the cynips quercifolii, called gall nut.

This species of oak is a native of the Levant, and of the warm countries of Europe.

An insect, the cynips quercifolii, deposits its eggs in the leaves, and other tender parts of the tree. Around each puncture an excrescence is presently formed, within which the egg is hatched, and the insect passes through all its stages of metamorphosis, until it become perfect, when it eats its way out of its prison.

These excrescences are called *galls*, or *gall nuts*. They are of different sizes, smooth or knotty on the surface, of a whitish, reddish, or blackish colour, and generally penetrated with a small hole. Galls have an austere styptic taste, without any smell; they are said to be the

most powerful astringent we possess, and have therefore been often employed in medicine. It is asserted, that, by their internal use, in doses of half a drachm, or more, of the powder, intermittent fevers have been cured, even after Peruvian bark had failed.

An infusion, or decoction of galls, may be used with advantage as an astringent gargle; and an ointment of one part of finely powdered galls to eight of any simple ointment is applied with success in hæmorrhoidal affections.

RESINA PINI. *Resin of Pine.* A resin, which is procured from pines of various species, deprived of its volatile oil.

The proper turpentines contain a large proportion of volatile oil, which is often separated from them by distillation. The residuum of the distillation gets different names, according to some peculiarities in its treatment. When the distillation is performed without addition, and continued until the whole essential oil be driven off, and there appear some traces of empyreuma, the residuum is fiddler's resin, or colophony: but if, while the mass is still fluid, a quantity of water be added, and thoroughly blended with the resin, by long and constant agitation, it is then called yellow resin.

This article is employed as an ingredient in ointments and plasters.

RHAMNUS CATHARTICUS. *Purging Buckthorn. Spina Cervina.* The juice of the berries.

This tree, or shrub, grows in woods or hedges; it attains if cultivated, the height of sixteen feet; it flowers in June, and ripens its fruit in September and October.

Buckthorn berries have a faint disagreeable smell, and a nauseous bitter taste. They have long been in considerable esteem as cathartics; and celebrated in dropsies, rheumatism, and even in gout: though in these cases they have no advantage above other purgatives, but are more offensive, and operate more severely than many with which the shops are furnished.

They generally occasion gripes, sickness, dryness of the mouth and throat; and leave a thirst of long duration. A syrup, prepared from the berries, is still kept in the

shops, though seldom prescribed. The dose is one ounce of syrup, or about twenty of the fresh berries, and twice or thrice this number in decoction.

The bark of the buckthorn is said to be a mild tonic, astringent, and antiseptic medicine, and is recommended for the cure of intermittents; and in general debility, after chronic diseases. The decoction is of great service; reducing inveterate inflammations of the eye; and curing the itch, as it cleanses the skin, and abates the burning heat, without repelling the humors.

RHEUM PALMATUM. *Palmated Rhubarb.* The root.

Palmated, true, or officinal rhubarb, is a native of China, and the East Indies; whence its culture has been introduced into Europe. The rhubarb hitherto employed in medicine, is imported from Turkey, Russia, China, and the East Indies. The first sort is brought in roundish pieces, perforated in the centre; and which are externally of a yellow colour, but, on being cut, they appear variegated with reddish streaks.

The Chinese rhubarb is imported in long pieces, which are harder, and more compact than the Turkey rhubarb; the former possessing a weaker aromatic flavour, is less esteemed, though, being more astringent, it is, for some purposes at least, equal to the latter. The general characters of good rhubarb are, its having a whitish or clear yellow colour; being dry, solid, compact, and moderately heavy; brittle, easy to be pulverized, forming a powder of a fine bright yellow, having a bitterish, somewhat astringent taste, and when chewed feeling gritty under the teeth, speedily colouring the saliva, and not appearing very mucilaginous.

The principal constituent of rhubarb is extractive matter, soluble both in alcohol and in water. By gentle decoction, it loses above one half its weight. The virtues of this root are destroyed by roasting, boiling, and in forming the extract.

Rhubarb is justly prized as a mild cathartic, and may be safely administered to children, invalids, and delicate women, in doses of from ten to twenty grains, though, in irritable, hysterical, and phthisical habits it is apt to occasion gripes, and aggravate febrile symptoms: hence it ought never to be given in the first stage of dysentery, when this invaluable remedy, by premature use, may oc-

casion the most violent pain, and inflammation of the bowels; but, after the fever is suppressed, and the disease becomes a chronic diarrhœa, small doses of rhubarb are attended with the best effects.

Beside its purgative quality, it is celebrated as an astringent, by which it strengthens the tone of the stomach and intestines, and proves useful in diarrhœa, and disorders proceeding from laxity. Rhubarb exhibited in substance in the form of powder, operates more powerfully than in any other way. The dose for an adult is from a scruple to a drachm. On account of its great bulk it is sometimes unpleasant to the taste, and its laxative effects are often increased by the addition of neutral salts, or other more active purgatives. Combined with calomel, it is much more efficacious as a cathartic. The infusion is considerably weaker than the powder, and requires double the dose to produce the same effect. It is well adapted for children, but must be always fresh prepared. In the form of tincture, its principal use is as a tonic, and stomachic. Small doses of the powder are frequently exhibited with the same intention.

Attempts have been successfully made to introduce the culture of this valuable drug into Britain, and it appears from authentic accounts, that sufficient quantities of it may be reared, and that the English root has proved to be fully equal to the best sort obtained from Turkey or China.

The cultivation of rhubarb in the United States is to be considered as an object of high importance. That our climate is perfectly congenial to its growth, has been clearly ascertained by successful experiments, which ought to encourage other attempts and more extensive plans. The palmated or officinal rhubarb may be raised from seed sown either in the spring or autumn. When the plants appear they require to be kept clear from weeds, and during the winter their roots should be covered with litter. The ensuing season they may be transplanted, or thinned, to the distance of four or five feet. The soil must be a light fine mould, deeply ploughed, and the plants should be frequently watered, though too much wet will injure the roots. The young plants require to be sheltered from the sun till they have obtained a good degree of strength. The seed stalks ought to be cut off on the withering of the radical leaves, and their roots covered.

The roots of rhubarb must not be taken up until six or seven years old, and it is supposed by some that they increase in medicinal properties if suffered to remain in the earth for seven, eight, ten, or even twelve years. Much care is requisite in curing and preserving the roots for use. They loose about four-fifths of their weight in drying, which process is accomplished in six months.

The roots may be taken up early in the spring, or in autumn, when the leaves are decayed. They are to be washed clean, and the small fibres and external rind being pared, or cut off, they should be divided into pieces about one ounce in weight. A hole should be perforated in the middle, and the roots suspended on pack thread, in a common kitchen, to dry; care being taken that none of the pieces come in contact with each other so as to occasion mouldiness. The foot stalks of the leaves of the young plants impart an agreeable acidity, similar to that of gooseberries, and are frequently used in pies and tarts.

RHODODENDRON CRYSANTHUM. *Yellow flowered Rhododendron.* The leaves.

This small shrub grows in the coldest situations in Siberia. The leaves are oblong, rigid, reflected at the edges, rough on the upper surface, smooth, and paler on the lower. When dried, they have no smell, but a rough, astringent, and bitterish taste. They also contain a stimulant narcotic principle; for they increase the heat of the body, excite thirst, and produce diaphoresis, or an increased discharge of the other secretions or excretions; and, in a larger dose, inebriation and delirium.

The Siberians use a decoction of it in rheumatism and gout. They put about two drachms of the dried shrub in an earthern pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night, and this they take in the morning.

Besides its other effects, it is said to produce a sensation of prickling, or creeping in the pained parts; but in a few hours the pain and disagreeable symptoms are relieved, and two or three doses generally complete the cure. The use of liquids is not allowed during its operation, as they are apt to induce vomiting.

Rhus Copallinum. *Narrow leaved Sumach.* The berries.

Narrow leaved Sumach, grows naturally in most parts of the United States; rising to the height of six feet in a slaty gravelly soil. The berries are very acid, and are sprinkled with a grayish pounce, of an agreeable acid taste.

Rhus Glabrum. *Pennsylvanian Sumach.* The berries.

Rhus glabrum, smooth Pennsylvanian sumach, common or upland sumach, rising to the height of eight or ten feet. The leaves are feathered, sawed, lanced, naked on both sides, and change to a beautiful red in autumn: it flowers in July. The seeds are arranged like the flowers, are red, and covered with a white powder of an agreeable acid taste.

The two species above described are considerably astringent. An infusion of the berries sweetened with honey is sometimes used for a gargle in sore throats, and for cleansing the mouth in putrid fevers. They are also recommended as useful in several of the arts. The leaves or berries are found a valuable substitute for *nut galls* in dyeing or making ink, they give a deep and permanent black. The plants in all their parts may be used as a succedaneum for oak bark in tanning, especially the white glove leather.

Rhus Radicans. *Poison Vine. Poison Creeper.*

Poison vine, has a slender ascending stem, and frequently climbs up to the top of our tallest trees. The flowers, which appear in June, are produced along the whole course of the smaller branches; they are small, are of a light yellow colour, and have a delightful odour.

Rhus Typhinum. *Virginian Sumach. Stags Horn. Vinegar Plant.* The berries.

This plant grows naturally in almost every part of the United States. In Virginia and Pennsylvania, it rises to the height of twelve or fifteen feet, with a trunk of six or eight inches in diameter. The young branches are

covered with a soft velvet-like down, and from their resemblance to the horn of a stag, the common people have given it the appellation of stag's horn. The flowers are produced in close tufts at the end of the branches, and are succeeded by seeds inclosed in purple, woolly, succulent covers; so that the branches are of a beautiful colour in autumn.

This plant resembles in its properties the rhus copallinum and glabrum.

RHUS TOXICODENDRON. *Poison Oak. Swamp Sumach.*
The leaves.

Poison oak, a low shrubby stalk: leaves trifoliate, with pretty large foot stalks, lobate, entire, smooth, and somewhat heart shaped. The flowers come out from the sides of the stalks, in loose panicles, are small, and of an herbaceous colour. This plant, sometimes called poison wood, is so acrimonious, that the touching of the leaves, or rubbing them on the skin, occasions itching, inflammation, and eruption.

Dr. Alderson, of Hull, has given the leaves in four cases of paralysis, in doses of half a grain, or a grain, three times a day, with marked success; all his patients recovered to a certain degree, the use of their limbs. The first symptom of amendment was always an unpleasant feeling of prickling or twitching in the paralytic limbs. It has been given in large doses, without experiencing the same success. It was not however inactive. In one case the patient discontinued its use on account of the disagreeable prickling it occasioned; and in general it operated as a gentle laxative, notwithstanding the torpid state of the bowels of such patients.

RHUS VERNIX. *Varnish Tree. Poison Oak. Swamp Sumach. White Sumach.*

Swamp sumach is the largest of our native species of rhus; grows in swamps, and makes a fine appearance. In New England this is commonly called dogwood.

The rhus radicans, toxicodendrum and vernix, are highly poisonous, and are particularly active in warm weather, after a meal, and when the part touching the plant is moist with sweat. The rhus vernix is more violent than the other species, the poison will be communi-

cated by touching, and by smelling any part of the shrub, or even by the smoke while burning, or the steams of a decoction of the plant. In about forty-eight hours an inflammatory eruption appears on the surface of the skin, attended by pain, swelling, itching, and fever. The eruptions sometimes suppurate, after which, the inflammation subsides, and the ulcers heal in a short time, but the patient frequently remains blind for several days. It operates, however, somewhat differently in different constitutions; and what is singular, some constitutions are incapable of being poisoned with it at all. The remedies are bloodletting; when the symptoms are violent, smart purging, especially by sea water; cold water, or ice, or a wash of spirits of *sal ammoniac* diluted with water, or of lead water applied to the parts. Dr. Barton has always found a solution of *corrosive sublimate* in water, to answer the purpose of effecting a speedy cure.

One case of the remarkable effects of this poison has fallen under the observation of the compiler of this volume. The patient, having incautiously expressed a quantity of the juice from the leaves of a species of rhus, was soon after attacked with violent inflammation, eruption, and swelling of the whole body, with fever and extreme pain. The whole surface of the body, swelling of the head, and blindness, exhibited the appearance of the most malignant kind of small pox; and so obstinate were the dangerous symptoms, that with the loss of his hair and nails, it was several weeks before a cure was effected.

Dr. T. Horsefield, in his excellent inaugural dissertation on the rhus vernix, rhus radicans, and rhus glabrum, declares his full conviction, after many judicious experiments, that the rhus vernix is the true varnish tree of Japan, described by Kempfer. He found that the greatest quantity of juice was obtained from incisions made in the tree about the middle of May. Thunbery, and others, are also of opinion, that the Japanese varnish so much celebrated, may be obtained from our native rhus. It is a subject undoubtedly worthy of attention.

A singular instance is related in the Medical Repository, of the poisonous effects of the *rhus vernix* on a swarm of bees, the whole of which the day after they attached themselves to the branch, were found dead, and their bodies turned black, and swelled to nearly twice their natural size.

RIBES. *Currant tree.* The fruit.

The fruit of the *red,* and *white currants* of our gardens are greatly esteemed for their pleasant and nutritive qualities.

In fevers, the juice of currants, when mixed with an equal quantity of sugar, and made into a jelly, is cooling and grateful to the stomach; being in a slight degree astringent and antiseptic. *Currant wine,* with the addition of water, is an excellent beverage during the heat of summer. Various receipts are given for making this liquor in the Dom. Encyclopedia.

Black currant is found growing, naturally, near *Kennebeck river,* and they are also cultivated in gardens.

This fruit is reputed to be very wholesome, and their juice is frequently boiled down into an extract or syrup with sugar, in which state it is called rob, and much esteemed in sore throats of the inflammatory kind.—The fruit is often put into rum or brandy instead of black cherries. An infusion of the young roots is useful in fevers of the eruptive kind; and in the dysenteric fevers of cattle.

RICINUS COMMUNIS. *Palma Christi.* The seeds and their fixed oil, called castor oil.

The palma christi is a native of the West Indies, and flourishes extremely well in almost every part of the United States. In Georgia and South Carolina, its growth is very luxuriant, rising to the height of fifteen or twenty feet, even without the assistance of the hand of culture, and exhibiting a beautiful appearance. In Mr. Drayton's history of South Carolina, it is asserted that its produce is from one hundred to one hundred and fifty gallons of oil per acre. Estimating this at four dollars per gallon, the ordinary price, it will be found to afford ample encouragement for its extensive cultivation, especially since the plant is not liable to be greatly affected by the vicissitudes of the season. It answers best in a rich sandy soil, and the seed should be put in early in the spring. The seeds are about the size of small beans, which, in their brittle shells, contain white kernels, of a sweet, oily, but somewhat nauseous taste. The skin is extremely acrid, and one or two of the seeds swallowed entire, operate as a drastic purgative or emetic.

The kernels yield almost a fourth part of their weight of a bland fixed oil, commonly called castor oil.

It is obtained from them either by expression or decoction with water. The former method is practised in Europe; the latter in Jamaica. To increase the product, it is common to parch the seeds over the fire, before the oil is extracted from them; but the oil thus obtained, is greatly inferior to that prepared by cold expression, or simple decoction, and is apt to become rancid. The most eligible method is, to shell the seeds and boil them in water; as the oil rises, skim it off. This oil is sweet, without bad taste, or smell, and as clear as olive oil; and may be kept much longer than that obtained by expression, because the water detains the mucilage, which abounds in the expressed oil, and disposes it the sooner to become rancid, and unfit for internal use. Genuine castor oil is thick and viscid, of a whitish colour, insipid or sweetish to the taste, and without smell.

Castor oil is a gentle and useful purgative; it in general produces its effects without griping, and may be given with safety, where acrid purgatives are improper, as in colic, calculus, gonorrhœa, &c. It is also one of the best vermifuges, and a most efficacious remedy for the dry bellyache and iliac passion, when administered in proper doses, to children and adults; viz. the dose for the former, from one to two tea spoonfuls; and the latter, a table spoonful, repeated every two or three hours. Half a tea spoonful has been given with success to new-born infants, for lubricating the intestines, and expelling the *meconium*. As patients in general have a great aversion to this oil in its pure state, it may be taken swimming either in a glass of peppermint, or simple water, or in the form of an emulsion, with mucilage, or with the addition of a small quantity of rum.

Rosa Gallica. *Red Rose.* The petals.

The Gallica, French or common red rose, has large, spreading, half double, deep red flowers. It has not the fragrance of the damask rose, but the beautiful colour of its petals, and their pleasant astringency, have rendered them officinal. It must however be remarked, that their odour is increased by drying, while that of the damask and moss roses is almost destroyed.

ROSA DAMASCENA. *Damask Rose.* The petals.

This is justly termed the *queen of flowers,* and both its elegance and fragrance have rendered it the favourite ornament of every garden. It is sometimes called Dutch hundred leaved rose. The damask rose yields on distillation, a small portion of butyrous oil, together with a water, which possesses the odour and taste of the roses, and are generally esteemed for the agreeable flavour they impart to culinary preparations, and also to cordials. A valuable perfume is obtained from the flowers by distillation, called *ottar* or *essence of roses.* The true ottar of roses is sold in the East Indies, at the exorbitant price of *twenty guineas* and upwards per ounce. It is doubtless the most elegant perfume in vegetable nature; as a single drop imparts its fragrance throughout the room or dwelling, and suppresses other less agreeable odours.

ROSA CANINA. *Dog Rose.* The fruit, called hips.

The common wild briar, or hip tree, an indigenous plant, growing in woods and hedges. In the month of June it bears oval flowers, which are succeeded by red egg shaped berries. It is the fruit of this shrub, that is employed in Britain by the apothecary for making the conserve of hips. The pulp of the fruit, besides saccharine matter, contains citric acid, which gives it an acid taste.

ROSMARINUS OFFICINALIS. *Rosemary.* The flowering tops.

Rosemary is a shrubby perennial, which grows wild in the south of Europe, and is cultivated in gardens. It has a fragrant smell, and a warm pungent bitterish taste, approaching to those of lavender: the leaves and tender tops are strongest; next to these the cup of the flower; the flowers themselves are considerably the weakest, but most pleasant. From the leaves, tops, and flowers of this plant an essential oil is prepared; or, when distilled with spirit of wine, they afford the celebrated *Hungary water.*

These liquid medicines are esteemed excellent cephalics, in nervous and hysterical affections, and have been

found eminently serviceable in apoplexies, palsies, and vertigoes, in which cases they are sparingly applied to the temples and forehead.

Rubia Tinctorum. *Madder.* The root.

Madder is perennial, and grows wild in some parts of Britain, but the dyers are principally supplied with it from Zealand, where it is cultivated in large quantities.

The roots consist of articulated fibres, about the thickness of a quill, which are red throughout; have a weak smell, and a bitterish astringent taste. For the use of dyers, they are first peeled and dried, then bruised and packed in barrels.

The root of the common or wild madder is an excellent detergent, and aperient; on which account it has been highly recommended in visceral obstructions, particularly of the uterus; in coagulations of the blood, induced either by falls or bruises; in the beginning of dropsical complaints, and especially in the rickets. It may be given pulverized in doses of from five to fifteen grains to children; and from half to a whole drachm, three or four times in a day, to adults. When taken internally, it possesses the remarkable quality of tinging the urine of a deep red colour, and produces similar effects on the bones of animals, if eaten with other food. Madder might be profitably cultivated in the United States.

Rumex Aquaticus. *Water Dock.* The root and leaves.

It grows in peat marshes, wet ditches, pools, at the sides of rivers, and in shallow water. It flowers in July and August, and is succeeded by large seeds. This plant affords a medicine of considerable efficacy, when applied externally, as a wash for spongy, putrid gums; its roots when pulverized have been found excellent for cleaning the teeth. These roots are of a bitter, astringent taste, and have often been employed for the cure of scorbutic and cutaneous disorders, whether administered internally, or applied externally in ointments, cataplasms, lotions, or fomentations. Decoctions of the leaves are, likewise, an efficacious laxative, and have been taken with advantage in rheumatic pains, and chronical diseases occasioned by costiveness, or by visceral obstructions. The dose

usually given, is a decoction of half an ounce of the fresh roots, or from one to two drachms of them, in a dry state.

The Indians, says Dr. Cutler, used the root of water dock with great success in cleansing foul ulcers. It is said, they endeavoured to keep it a secret from the Europeans.

Dr. Withering says, he saw an ill conditioned ulcer in the mouth, which had destroyed the palate, cured by washing the mouth with a decoction of this root, and drinking a small quantity of the same decoction daily.

RUMEX ACUTUS. *Narrow Dock.*
RUMEX CRISPUS. *Curled Dock.* } The roots.

These grow about barn yards and in cultivated fields, flowering in July. The roots of both species are somewhat cathartic. The seeds are said to have been given with advantage in dysentery. The fresh roots bruised and made into an ointment or decoction cure the itch. Some instances have occurred among the country people, of ill conditioned ulcers, and hard tumors apparently of a cancerous nature, having been entirely removed by the application of the bruised roots of dock or a decoction of the same.

RUTA GRAVEOLENS. *Rue.* The herb.

This is a small shrubby plant met with in gardens, where it flowers in June and holds its green leaves through the winter. It has a strong ungrateful smell, and a bitterish, penetrating taste; the leaves when in full vigour, are extremely acrid, insomuch as to inflame and blister the skin if much handled. Former writers on Materia Medica have entertained a very high opinion of the medicinal virtues of this plant, and it is still retained in the Massachusetts and other Pharmacopœias. It has been considered as powerfully stimulating, attenuating, and detergent, and hence, in cold phlegmatic habits it quickens the circulations, dissolves tenacious juices, opens obstructions of the excretory glands, and promotes the fluid secretions. Boerhaave is extravagant in his praises of the essential oil and distilled water of rue, for their efficacy in promoting sweat and perspiration, and for the cure of the hysteric passion and of epilepsies, and for expelling poison. In modern practice, rue is not regarded as possessing much power as a remedy.

SACCHARUM OFFICINARUM. *Sugar Cane.* Sugar.

a. brown, or impure.

b. double refined, or most pure.

The sugar cane grows wild in both the Indies, and forms the principal object of cultivation in the West-Indies.

It grows to the height of from three and a half to seven, and sometimes to twelve feet, in strong, deep lands. When ripe it assumes a fine straw colour, and is usually cut at the age of twelve or fifteen months, according to the season, or the nature of the soil.

Sugar is principally obtained from the plant by boiling down its expressed juice, with the addition of a certain proportion of lime or potass, until the greater part be disposed to concrete into brownish or yellowish crystalline grains. In this dry state, it is called *raw* or *muscovado* sugar, and is sent to Europe, where it is subsequently refined. This is performed by dissolving it in water, boiling the solution with lime water, clarifying it with blood or white of eggs, and straining it through woollen bags. The solution, when in a proper state, is poured into conical forms of unglazed earthen ware, where it concretes into a mass of irregular crystals. The syrup, which has not been crystalized, is then permitted to run off through a hole in the apex of the cone. The upper or broad end of the cone is then covered with moist clay, the water of which gradually penetrates into the sugar, and displaces a quantity of syrup, which would otherwise be retained in it, and discolour it. It is then carefully dried, and gets the name of *loaf* or *lump sugar*. When the solution, and other steps of the process are repeated, the sugar is then said to be *double refined*. Sugar is sometimes made to assume a more regular form of crystalization, by carrying the evaporation only to a certain length, and then permitting the syrup to cool slowly: In this form it is called *brown* or *white sugar candy*, according to the degree of its purity.

Sugar is a very wholesome and powerful article of nourishment; for during crop time, the negroes in the West Indies, notwithstanding their increased labours, always grow fat. It produces no particular effect as a medicine, except that the coarser and impure kinds are

slightly purgative. In pharmacy, it is principally employed to cover bad tastes, to give form, and to preserve more active substances. In using it for the last purpose, we must always remember, that if the proportion of sugar employed be too small, it will promote instead of retarding the fermentation of the articles it is intended to preserve. Molasses or treacle is a very impure syrup, which remains after refining the sugar. Treacle is applied to many domestic economical purposes; and, in hospital practice, may supersede the use of sugar in many instances. Sugar candy is used by persons labouring under hoarseness and coughs; the violence of which it contributes to relieve, by lubricating the membranes, and promoting expectoration.

SALIX ALBA. *White Willow.* The bark, and the bark of the root.

The species or varieties of the willow, which have been noticed by botanical writers, are very numerous; and it is probable that the bark of all of them possesses properties in many respects similar. In 1763, Mr. Stone, an English clergyman, presented a paper to the Royal Society, on the beneficial effects of the *salix alba*, or white willow, in intermittent fevers; and Dr. Cullen, on this authority, and from the sensible qualities it possesses, recommends it, in his *Materia Medica*, as a substitute for the cinchona. Mr. Stone gathered the bark in summer, when it was full of sap; dried it by a gentle heat, and gave a drachm of it powdered every four hours, betwixt the fits. In a few obstinate cases he mixed it with one-fifth part of the cinchona. Some judicious physicians here, says Dr. Cutler, made trial of the bark of white willow, and recommend it as a valuable substitute for the Peruvian bark. They have used principally the bark of the root.

SALIX LATIFOLIA. *Broad leaved Willow.* The bark.

This possesses greater medicinal properties than any of the other species of salix; and is now substituted by many British physicians for the Peruvian bark. Three British pamphlets upon this subject have been published within a few years; the last, by Dr. Wilkinson (1803) is replete with encomiums on the remedy in question. This

species of salix may be distinguished by the shape of its leaves from all others, except the salix pentandra, or bay leaved willow. But the leaves of the latter are smooth and shining, and of a deeper green; nor have they the downy appearance on the under surface, which is so remarkable in the *salix caprea* or *latifolia*. It is found in woods and hedges on hilly situations, and delights in cold, clayey, moist ground. The most proper time to gather the bark, is in May or June; it should be cut in small pieces, and dried in the shade. This bark is very astringent to the taste, and somewhat bitter, but it loses the latter quality when dry. Dr. Wilkinson directs one ounce and a half of the coarse powder of the bark to be infused in one quart of water for six hours; then to boil it over a gentle fire for a quarter of an hour, and strain for use: of this the ordinary dose is two or three large spoonfuls, three or four times a day; but in the ague and fever, one or two ounces may be given every third hour, in the interval of the fit. The strong decoction of this bark resembles port wine in colour, for which, by several who have seen it in vials, it has been mistaken.

Dr. Wilkinson relates sixteen cases of disease, in which this bark was employed with decided advantage, and from which he does not hesitate to assign to it virtues greatly superior to those of the cinchona: in particular he relates a case of extreme emaciation from an ulcerated foot, which was perfectly cured, after having resisted the continued use of Peruvian bark, and the exertion of the physicians of two public charities. It is doubtless a remedy of considerable efficacy, and is strongly recommended on account of its cheapness, and the facility of procuring it. It appears to be useful in most cases where the cinchona is usually resorted to.

The attention of medical men should be directed to the inquiry, whether the *salix latifolia* may be found in the United States, as it promises to afford a valuable substitute for the *cinchona;* the price of which has become exorbitant, and its quality greatly impaired by base and fraudulent adulterations.

Salvia Officinalis. *Sage.* The leaves.

The leaves of the sage have a peculiar aromatic smell, and a warm aromatic taste, with some degree of bitterness and astringency.

In its effects, sage agrees with other aromatics. It is stimulant, carminative, and tonic. In cold, phlegmatic habits, it excites appetite, and proves serviceable in debilities of the nervous system. The best preparation for these purposes, is an infusion of the dry leaves, drank as tea; or a tincture, or extract, made with rectified spirit, taken in proper doses; these contain the whole virtues of the sage; the distilled water and essential oil, only its warmth and aromatic quality, without any of its roughness or bitterness.

Aqueous infusions of the leaves, with the addition of a little lemon juice, prove an useful diluting drink in febrile disorders, being sufficiently agreeable to the palate.

SAMBUCUS NIGRA. *Common Elder.* The inner bark, flowers, and berries.

This tree is frequent in hedges; it flowers in May, and ripens its fruit in September. The berries contain malic acid, and have a sweetish, not unpleasant taste; nevertheless, eaten in substance, they offend the stomach.

The expressed juice inspissated to the consistence of a rob, proves an useful aperient medicine; it opens obstructions of the viscera, promotes the natural evacuations, and, if continued a length of time, does considerable service in various chronical disorders.

The inner green bark of its trunk is greatly cathartic. An infusion of it in wine, or the expressed juice, in the dose of half an ounce or more, is said to purge moderately; and, in smaller doses to prove an efficacious deobstruent, capable of promoting all the fluid secretions.

The young leaf buds are strongly purgative, and act with so much violence, as to be deservedly accounted unsafe. The flowers are very different in quality; these have an agreeable aromatic flavour, which they yield in distillation with water, and impart by infusion to vinous and spirituous liquors.

SANGUINARIA CANADENSIS. *Blood Root. Puccoon.* The seeds and root.

This is a common plant in the United States, and is called also red root, Indian paint, turmeric. The leaves are roundish, and deeply indented; stems naked, supporting single flowers; blossoms white. It grows in rich

woodland, and flowers in April. When the fresh root is broken, a juice issues in large drops resembling blood. The Indians used it for painting themselves, and highly esteemed it for its medicinal virtues. It is emetic and cathartic, but must be given with caution. An infusion of the root in rum or brandy, makes a good bitter. If it be planted in rich shady borders, it flourishes well in gardens: and the large leaves and blossoms make an agreeable appearance soon after the frost is out of the ground.

[*Cutler's account of indigenous vegetables.*]

From an inaugural dissertation on *Sanguinaria*, by Dr. Downy (Philadelphia, 1803), the following useful information is obtained. "The root is from one fourth to half an inch in diameter, from three to four inches long, sending forth numerous stringy fibres, two or three inches long: a coloured liquor is thrown out when the root is broken. The stalk is six or eight inches long, and of the thickness of a quill. The leaves are cordate and lobate.

"There is but one leaf to a stalk; on each lobe, one large fibre, of a light yellow colour, may be seen running from the stalk, and many smaller ones branching from it in all directions. The powdered root, in doses of fifteen or twenty grains, is powerfully emetic. Eight grains is a mild dose, and is but little inferior to ipecacuan. It contains a large proportion of gum, some resin, and extractive matter. The first and last are the most active parts.

"The leaves and seeds of the plant are powerful and diffusible stimuli; promote sweat, and are given in Maryland with that view to horses, to promote the shedding of their coats. A tincture of the root is used to prevent the intermittent fever; and a decoction of the roots to cure the dysentery. In one case, it operated powerfully upon the uterus, and produced abortion; hence it might be useful in female obstructions."

The seeds are said, by professor Barton (collection for Materia Medica) to possess nearly the same quality of those of stramonium, viz. they induce fever, delirium, dilated pupil, &c. A deleterious property resides also in the leaves. The root has been used in gonorrhœa, for the bites of serpents, and in bilious diseases; and the juice is employed to destroy warts. In some parts of New England, a spirituous tincture of the roots is used as a tonic bitter. It is expectorant, and is apparently allied in properties to rattle snake root.

The medical properties of *Sanguinaria* have been inves-

tigated by numerous trials in the hands of Aaron Dexter, M. D. professor of chemistry and Materia Medica, university at Cambridge. The experimental tests of this gentleman, corroborated by those of other respectable physicians, afford the most satisfactory evidence, that it possesses very active powers, and that in doses of one grain of the powdered root, or ten drops of a saturated tincture, it proves efficacious as a stimulant and diaphoretic. But in large doses, it excites nausea and vomiting, and if incautiously administered, it is of dangerous tendency.

It is said to be efficacious in removing jaundice, and is believed to be a chief ingredient in the quack medicine known by the name of Rawson's bitters.

Dr. Israel Allen, of Sterling, and others, have had recourse to this medicine as a substitute for digitalis, in coughs and pneumonic complaints; and on some occasions it is said to have proved equally efficacious, and less debilitating than foxglove, when exhibited with the same precautions.

The dose of the saturated tincture of the root is from thirty to eighty drops twice in the day, increasing or decreasing the number as particular circumstances may require.

SAPO. *Soap.* Prepared with oil of olives and soda, called castile soap.

Soap, is a composition of fixed alkaline salt, in a state of combination with animal or vegetable oil; it is sometimes dry, and hard; at others, soft and liquid; being manufactured various ways, with and without heat.

The only difference in the various kinds of manufactured soap, is, in the oils employed in the composition. Thus, the common hard soap is prepared from the caustic ley, with the addition of tallow. The *Venice, Alicant* or *Spanish* soap, with olive oil; green soap, with that of rape, hemp, or linseed; black soap, with train oil; and, lastly, the ordinary soft soap, is formed by using potass as a substitute for soda, together with tallow, or train oil, to which is added a large quantity of common salt.

The perfumed compounds, known under the names of palm, violet, almond, or other soaps, are prepared in a similar manner; the oils of such vegetable substances being employed instead of those of the usual kind.

The alkaline soaps have an unpleasant taste, and a peculiar smell; form a milky solution with water, and a transparent one with alcohol, and are powerfully detergent.

The only species which is officinal in our pharmacopœia, is that composed of olive oil and soda. It is only prepared in the countries which produce the oil. For medicinal use, we prefer the Spanish.

It should be white and hard, dissolved entirely in water and in alcohol, forming with the former a milky, and with the latter a transparent solution; the solution should froth freely on agitation. It should not be variegated in its colour, feel greasy or moist, or be covered with a saline efflorescence; and the solutions should not have a rancid smell or taste. Some of the foreign dispensatories are so very particular about the nature of the soap, used in medicine, as to direct it to be prepared by the apothecary, by simply triturating (without the assistance of heat) Provence oil, with half its weight of a solution of soda, of the specific gravity of 1.375, until they unite.

Soap is decomposed by all the acids, earths, and earthy and metalline salts. The acids combine with the alkali and separate the oil. The earths form an insoluble earthy soap with the oil, and separate the alkali; while with the salts there is a mutual decomposition, their acid combines with the alkali, and earthy, or metalline soaps are formed.

The detergent property of soap, or the power it possesses of rendering oily and resinous substances miscible with water, has given rise to very erroneous notions of its medical virtues. It was supposed to render such substances more readily soluble in the juices of the stomach, and in the fluids of the body, and to be well fitted for dissolving such oily and unctuous matters as it may meet with in the body, attenuating viscid juices, opening obstructions of the viscera, and deterging all the vessels it passes through.

It has likewise been supposed a powerful menstruum for the urinary calculus; and a solution of soap in lime water, has been considered as one of the strongest dissolvents that can be taken with safety into the stomach; for the virtue of this composition has been thought considerably greater than the aggregate of the dissolving powers of the soap and lime water when unmixed.

How erroneous these ideas are, appears evidently, when we recollect the very easy decomposition of soap, which

renders it perfectly impossible that it should enter the circulating system, or indeed come into contact with the fluids even of the mouth, without being decomposed. As to the solution of soap in lime water, we may observe, that it is only a clumsy way of exhibiting a solution of soda; for the soap is decomposed, an insoluble soap of lime is formed, and the soda remains in solution. The internal use of soap should therefore be confined, in our opinion, to the giving form to other substances which are not decomposed by it, and to decompose metallic poisons when they have been taken into the stomach. For this last purpose, a teacup full of a solution of soap, in four times its weight of water, may be drank every three or four minutes, until a sufficient quantity be taken.

Applied externally, it is a very powerful detergent, and combines the stimulating properties of the alkali with the lubricating nature of the oil. In this way it often proves a powerful discutient, and an useful application to sprains and bruises. A weak solution of it in water forms an excellent injection in virulent gonorrhœa.

Scilla Maritima. *Squill.* The root.

The squill is a perennial bulbous rooted plant, which grows wild on the sandy shores of Spain, Portugal, and the Levant. The best sea-onions ought to be sound, fresh, and to contain a viscous juice; they are nauseous, bitter, and, if much handled, are so acrid as to ulcerate the skin. It is more commonly met with in the shops, in the form of dried scales, which should be brittle, semipellucid, smooth, but marked with lines, and when chewed, should feel tenacious, and taste very bitter, without manifest acrimony.

The active constituent of the squill is the acrid principle; and, therefore, it becomes almost inert by drying, or by being kept too long in the form of powder. The squill is a powerful stimulant, promoting the discharge of urine; and if the patient be kept warm, a profuse perspiration.

It is chiefly employed in cases where the organs of perspiration are clogged, or oppressed with mucus.

When combined with nitre, in the proportion of from five to ten grains of the dried root, with a double quantity of nitre, it has been greatly extolled for its efficacy in dropsical swellings, and in inflammation of the kidneys.

If the squill be taken in a large dose, it operates as an emetic; and, in some persons, as a purgative. In some cases it produces even strangury, bloody urine, inflammation, and erosion of the stomach. In smaller doses, however, it proves an useful expectorant and diuretic, and is peculiarly serviceable in phlegmatic habits, where the lungs are oppressed with viscid matter.

The dose of squill is one or two grains, two or three times a-day; and the most commodious form, unless when designed as an emetic, is that of a bolus, or pill: though when mixed with honey into an *oxymel*, it affords an useful medicine in obstinate coughs.

SCUTELLARIA LATERIFLORA. *Blue Scull-cap. Hooded Willow Herb.* The plant.

The scutellaria is perennial, of which there are numerous species indigenous to the United States. The plant is found in great abundance on the banks of rivers and the borders of ponds; flowering in July or August. The stem is square, branched, and attains the height of from one to three feet. The leaves are opposite, narrow-pointed, on long foot stalks. The racemes are axillary and lateral, bearing small violet coloured blossoms, intermixed with small leaves. The calyx is hooded, or helmet-formed, from whence originated the generic name of Scull-cap or Scutellaria. It is now introduced here on account of its recently reputed efficacy as an antidote against the effects of *canine madness*. Should this plant ultimately prove a successful remedy for a disease so truly deplorable in its nature, and destructive in its consequences, no encomiums can surpass its merit even if recorded in letters of gold. The remedy was for many years a secret, in the possession of a family by the name of Lewis, in West Chester county, and in 1809 it was promulgated by Mr. R. Bowne, of New York, accompanied with strong evidence in favour of its antidotal powers. To the publication of Mr. B. [Med. Repos. Hexade 3. Vol. 2. No. 3.] was annexed an accurate engraving of this species of scutellaria, yet in his description he erroneously attached to it a specific name belonging to a different species, the *Scutellaria Galericulata*. This last species is to be distinguished by its axillary flowers in pairs, on pedicles from the alæ of the leaves, and pendulous.

With regard to the anti-rabid virtues of scutellaria, it

is to be observed, that subsequent to its promulgation, it has been investigated and tested by practical experiment, so far as opportunity and the nature of the subject permit. A mass of evidence in favour of its efficacy may be found in a production entitled, "Observations on Hydrophobia," lately published by the compiler of this work. As, however, it is still doubtful, and yet desirable to have the fact clearly ascertained how far this plant is entitled to the character of a specific preventative of hydrophobia, every humane person must consider himself warranted in resorting to the use of it on any occasion which may offer, either of alleviating the misery and distress of mankind, or of arresting the devastation among the brute creation.

This remedy is to be given in the form of strong infusion of the leaves every morning, fasting, and to be continued for several weeks. For cattle it may be mixed with their food or drink.

Secale Cornutum. *Ergot, or Spurred Rye.*

Rye is subject to a disease, particularly when a hot summer succeeds a rainy spring; the spurious substance thus produced is in France called ergot, from its resemblance to a cock's spur, but in England it is termed *horned rye*, spur, or *hornseed*. In Cullen's Materia Medica it is termed secale cornutum. Bread made of this kind of rye has a nauseous acrid taste, and produces numerous fatal diseases, as spasm, extreme debility, and mortification of the extremities. At various periods subsequent to the year 1596, the most alarming and destructive consequences were occasioned among the poor in France and England, by the use of bread made of such damaged grain. Horned rye is said to have been equally fatal to brutes and fowls, when fed with it by way of experiment.

Rye is affected with the disease in this country similar to that in Europe, particularly summer rye, in low, wet situations. The singular production called ergot, is found projecting from among the leaves of the spike, or ear; it is a long crooked excrescence, resembling the spur of a cock, pointed at its extremities, of a dark brown colour externally, and white within. Some spikes are occupied wholly by spurs, while others have two or three only, interspersed with genuine seeds of rye.

The medicinal properties of this extraordinary substance were first announced to the public by Dr. John Stearns, of Saratoga county, in a letter to Dr. Akerly, of New York, in which the article is extolled for its powers, *ad partum accelerandum*. It is now satisfactorily ascertained, that ergot is capable of exerting a specific action on the uterus, and of augmenting the powers of this organ during the efforts of parturition. Hence, in lingering and laborious cases it is found to be an invaluable medicine, speedily inducing forcible pains, and greatly expediting delivery. For obvious reasons, however, it is proper to caution against employing this powerful parturient in cases of preternatural presentation. In the form of powder, it is given from five to ten or fifteen grains; but it has sometimes been found more active in the form of decoction, half a drachm of the powder being gently boiled in half a pint of water; one third may be given every twenty minutes, until proper pains shall have commenced. A large dose of decoction, or of pulvis *ad partum accelerandum* will excite nausea and vomiting. No example of ergot having induced deleterious effects, has come to our knowledge; but there is much reason to suppose that it is capable of producing abortion at any stage of pregnancy.

We have now the satisfaction of deriving instruction on this subject from the experience of some practitioners of eminence in our own metropolis. A writer in the New England Medical Journal, No. I. Vol. I. asserts that it has not appeared to relax the rigidity of the muscular fibres, "but it has almost uniformly increased the efforts of the uterus to expel the fœtus." And also, that occasions have occurred, authorizing a caution of the highest importance in practice. The powerful and continued efforts of the uterus, from the effects of ergot, prevent the retreat of the child's head after being advanced, and that the unceasing pressure has in some instances occasioned the death of the child. Let this circumstance, therefore, have its due effect, and induce the utmost precaution in the administration of this powerful article. In one case of amenorrhœa, Dr. Beckman administered one drachm of ergot in decoction; bearing down pains immediately ensued, and the suppression was the next day removed. It has been successfully employed, on similar occasions, by other practitioners. However extraordinary it may appear, the assertion is from the most creditable source, that ergot has often

proved one of the most efficacious remedies in menorrhagia in all its stages; and moreover, it restrains in a remarkable manner the *profusio uterina* following the separation of the placenta in parturition.

In two instances ergot is stated to have been administered in considerable quantities during the early stage of pregnancy. In one case, about four drachms were taken within a few days; the consequence was regular pressing down pains, resembling the severest throes of parturition; and these recurred with every repetition of the medicine, yet on examination, the os uteri was not much dilated. In neither case was the natural term of gestation interrupted by the operation of the medicine.

The fact has long been known among our farmers, that rye itself possesses a quality of inducing abortion in females of the animal tribe, and they carefully withhold that grain from such, during their periods of gestation.

SESAMUM ORIENTALE. *Oily Grain. Benne.* The leaves and seeds.

This originally an African plant has become well known by the name of *benne* in South Carolina and Georgia, or the Vangloe of the West Indies. It is an annual plant, rising with an herbaceous four cornered stalk, two feet high, sending out a few short side branches; the leaves are oblong, oval, a little hairy, and stand opposite. The flowers terminate the stalk in loose spikes; they are small, of a dirty white colour, shaped somewhat like those of foxglove. After the flowers are past, germen turns to an oval acute pointed capsula, with four cells filled with oval compressed seeds, which ripen in autumn. Of late years the seeds have been introduced into the states of Georgia and South Carolina, by the African negroes, where the plant succeeds extremely well; and they boil a handful of the seeds with their allowance of Indian corn, which forms a nourishing food. But the excellency of these seeds, consists in their yielding a larger proportion of oil than any other vegetable with which we are acquainted. One hundred weight of seed will produce ninety pounds of oil of an equal and even preferable quality to Florence oil. It will keep good many years without contracting any rancid smell or taste, and when the warm taste of the seed, discovered in the oil when first drawn, is worn off, it becomes quite mild, and is found to

be a pleasant and agreeable substitute for all the purposes of salad oil. The benne oil in some parts of the southern states is esteemed as a gentle laxative, in those cases where the more nauseous castor oil is usually employed. It also burns well in lamps. The leaves of this plant by infusion or decoction are found to afford an excellent mucilage; well adapted to all the intentions of that class of remedies, and in 1803, was used with the most marked good effect, in an epidemic dysentery in South Carolina. Considering, therefore, the great utility and importance of the benne plant, its cultivation by our patriotic planters cannot be too strongly recommended.

SINAPIS ALBA. *White Mustard.*
SINAPIS NIGRA. *Black or common Mustard.* } The seeds.

These plants are both annual, both grow wild in England, and possess similar virtues. They produce small round compressed seeds, which have an acrid bitterish taste, and a pungent smell when reduced to powder. The common mustard has blackish seeds, and is more pungent than the white. They impart their taste and smell in perfection to aqueous liquors, while rectified spirit extracts extremely little of either: The whole of the pungency arises with water in distillation. Committed to the press, they yield a considerable quantity of a soft insipid oil, perfectly void of acrimony; the cake left after the expression, is more pungent than the mustard itself.

The imported mustard, so common at tables, and which is generally prefered to our own, is the pulverized seed of the black species; the difference consists only in the preparation of the powder.

The seeds unbruised are frequently given in palsies and chronic rheumatisms, and are found beneficial. They may be taken in the quantity of a table spoonful or more, and will gently relax the bowels. Rheumatic pains in the stomach are often relieved by taking them in brandy. The powdered seeds, with crumbs of bread and vinegar, are made into cataplasms, and applied to the soles of the feet in fevers, when stimulants are necessary. They are also topically applied in fixed rheumatic and sciatic pains. Dr. Withering says, wherever we want a strong stimulus, that acts upon the nervous system without exciting much heat, we know none preferable to the mustard seed. An infusion of the seed, given in large quantities, vomits;

but, in smaller doses, operates as an aperient and diuretic. Mustard whey, with wine, is used as a drink in fevers. Its acrimony is said to consist in an essential oil.

Mustard whey is made by boiling one and half ounce of the bruised seeds in a pint of milk, and as much water, till the curd be perfectly separated. This is perhaps the most elegant form in which mustard can be exhibited. A little sugar may be added, and an ordinary teacup full given four or five times a day in cases of low nervous fever, greatly warms and invigorates the habit, and promotes the different secretions.

SMILAX SARSAPARILLA. *Sarsaparilla.* The root.

This root is brought from the Spanish West Indies. It consists of a great number of long strings hanging from one head: the long roots, the only parts made use of, are of a blackish colour, on the outside, and white within, about the thickness of a goose quill.

They have a glutinous, bitterish, not ungrateful taste, and no smell. It was first brought into Europe by the Spaniards, about the year 1563, with the character of being a specific for the cure of the lues venerea, a disease which made its appearance a little before that time; and likewise of several obstinate chronic diseases. It has been combined with sassafras, guaiacum, liquorice, and other substances, in a decoction of the woods. It is, however, a very inert, mucilaginous substance; and the diaphoresis, which it is sometimes supposed to produce, is entirely owing to the warm and diluent regimen employed at the same time. Sarsaparilla is found in abundance in the vicinity of the Ohio river.

SOLANUM DULCAMARA. *Bitter Sweet. Woody Night Shade.* The twigs.

This plant grows wild in moist hedges; has woody, brittle stalks, and climbs on the bushes. But if there be no shrubs in their vicinity, the shoots creep along the ground, and frequently strike new roots. It flowers in the months of June and July. The taste of the twigs and roots, as the name of the plant expresses it, is both bitter and sweet; the bitterness being first perceived, and the sweetness afterwards.

The dulcamara was formerly much esteemed as a powerful medicine. It is generally said to occasion some

considerable evacuation by sweat, urine, or stool, particularly the latter. It has been recommended as a disentient and resolvent medicine; and it has been said to have been attended with good effects in obstinate cutaneous diseases of the herpetic kind. It has also been used, and sometimes with advantage, in cases of rheumatism, jaundice, and obstructed menstruation.

The twigs are principally employed under the form of watery infusion, in doses of two teacupfuls, morning and evening. Dr. Hill has found it very efficacious in the asthma.

SOPHORA TINCTORIA. *Linn.* } *Wild Indigo. Indigo*
PODALYRIA TINCTORIA. *Mich.* } *Weed.*

The root and plant.

This vegetable is indigenous, and supposed to be exclusively American. In Dr. Cutler's catalogue it is called *Indigo fera*, and it is sometimes known by the name of *broom*, but more commonly *Indigo weed*. It is perennial, growing in great abundance in almost every barren pasture and in woods. The stalk rises to two feet or more, sending off numerous branches. The leaves are small, ternate, inversely heart shaped, and sessile. In July and August all its branches display, butterfly shaped, golden coloured blossoms, which render the plant very conspicuous. The seed vessels are inflated, containing numerous seeds. The root is ligneous, rough, and irregular in shape, of a dark brown colour externally, and sending off many long slender branches. Its taste is unpleasant, subacrid, and nauseous, very similar to that of ipecacuan. The particular medical properties of indigo weed are yet to be ascertained; that it possesses great activity is unquestionably true; those who in the spring season have made the young shoots a substitute for asparagus experienced its drastic evacuating powers. In the hands of some physicians it is found to operate in a large dose, with much severity as an emetic and cathartic. But a weak decoction of the root has frequently been given with the effect only of a mild laxative. A decoction of the bark of the root has, it is said, been made known by an empiric experienced in its use, as a remedy in scarlatina anginosa, and its employment has been extended in a few instances to typhus or putrid fever with such good effect as to encourage farther trials. An

experienced physician considers it as an excellent antiseptic and febrifuge, prefering it in some fevers to Peruvian bark. As an external application, its antiseptic qualities ought to be more extensively known. In the form of fomentation or cataplasm, it has proved eminently beneficial when applied to phagedenic and gangrenous ulcers, especially if the decoction be administered internally at the same time.

A liniment prepared by simmering the *cortical part* of the root in cream, has been found an efficacious application to sore nipples and ulcerated breasts. A violet or pale blue colour has been prepared from the leaves and small branches of this plant, and used as a substitute for indigo. The leaves turn black when dried.

SPIGELIA MARILANDICA. *Carolina Pink.* The root.

This plant is perennial, and grows wild in most of our southern states. The roots are celebrated as an anthelmintic, particularly for the expulsion of lumbrici from the alimentary canal. Every part is possessed of the anthelmintic property, though the root is most active. It is commonly administered in the form of infusion; an emetic is generally premised, and its purgative effect assisted by some suitable addition, as senna or jalap. By some the powdered root is directed in doses of ten or fifteen grains; while others prescribe it in drachm doses. But it should be observed that according to the late Dr. Lining, of Charleston, when exhibited in large doses, and without proper precautions, it sometimes produces very singular and distressing effects upon the nervous system, such as vertigo, pains over the eyes, and dilated pupil. As a vermifuge, spigelia has acquired a superior confidence, and it often affords relief and effects a cure, in cases where no worms are discharged. It is supposed by Dr. Barton, that it will be found highly useful in some febrile diseases of children, unaccompanied by worms, especially in the insidious remittent which so frequently lays the foundation of dropsy of the brain.

SPIRÆA TRIFOLIATA. *Indian Physic. Ipecacuan, &c.* The root.

This shrub grows plentifully in the United States, and is one of the few active plants of the class icosandria.

The root, the part employed, consists, like that of the officinal Ipecacuan, of a bark, and woody part. The active power seems to reside exclusively in the bark. It is a safe and efficacious emetic, in doses of about thirty grains. It also seems to possess a tonic power, and has accordingly been thought peculiarly beneficial in intermittent fevers. It is sometimes very injudiciously employed by the country people, insomuch that they are obliged to apply for medical aid, to remove the debility induced by the large doses of the root which they employ. Another species, it is said, grows in Kentucky, which is still more valuable as an emetic, than the one under notice.

Spongia Officinalis. *Sponge.*

Sponge is principally found in the Mediterranean and Red Seas. It was long supposed to be a vegetable production, but is now universally allowed to belong to that remarkable class of animals called Zoophytes, which are negatively characterized by Cuvier, as having no vertebræ, no sanguiferous vessels, no spinal marrow, and no articulated limbs.

Sponge is a soft, light, very porous and compressible substance, which readily imbibes water. It is of extensive utility in domestic economy, medicine, and surgery. As it strongly adheres to the orifices of wounded vessels, it is advantageously employed as a styptic; often preventing the effusion of blood more effectually than the puff ball or *agaric*.

From its property of imbibing and distending by moisture, it is sometimes made use of as a tent for dilating wounds and ulcers. To fit it for these intentions, the sponge is immersed in melted wax, and subjected to pressure till cool. In this state it may be easily formed into proper tents, so as to be introduced where necessary. And from the gradual melting of the wax in consequence of the heat of the part, a dilatation of course takes place.

Sponge, cut in pieces, and burnt in a close iron vessel, till it become black and friable, and afterwards reduced to a very fine powder, has been successfully administered internally, in scrofulous complaints and cutaneous diseases, in doses of one scruple and upwards; it is also considered as a *specific*, on account of its efficacy in removing the glandular swellings of the neck, known under the name of *bronchocele*. But the virtues of burnt sponge

probably depend on the presence of a little alkali. It also contains charcoal; and its use may be entirely superseded by these substances, which may be obtained in other ways, and at a much cheaper rate.

If sponge be cut in small pieces, fried, or dipped in honey, or salt butter, and given to rats, it distends their bowels, and effectually destroys those animals.

STANNUM. *Tin.* The filings and powder.

Tin is one of the imperfect metals, and is found most frequently mixed with other metallic ores. It is now only used as an anthelmintic, especially in cases of tænia, and probably acts mechanically.

Tin is reduced to powder, consisting of small rounded particles, by heating it nearly to its melting point, and agitating it briskly. This powder is often employed as a remedy against worms, particularly the flat kind, which too often elude the force of other medicines. The general dose is from a scruple to a drachm; but Dr. Alston assures us, in the Edinburgh Essays, that its success depends on its being given in much larger quantities. He directs an ounce of the powder on an empty stomach, mixed with four ounces of molasses; next day, half an ounce; and the day following, half an ounce more; after which, a cathartic is administered. He says the worms are usually voided during the operation of the purge, but that pains of the stomach occasioned by them, are removed almost immediately upon the first dose of the tin. This practice is sometimes successful in the expulsion of tænia, but by no means so frequently as Dr. Alston's observations would lead us to hope.

STATICE LIMONIUM. *Marsh Rosemary. Lavender Thrift. Sea Lavender.* The root.

This is well known in the New England States. It is indigenous and perennial, growing on the sea shore, in salt marshes; and the fissures or clifts of rocks near the sea coast: it is in flower from July to September. The stem is naked, branched, and about a foot high. The radical leaves are long, pointed, and grow on foot stalks. The flowers are blue, and grow on long spikes on the tops of the branches. The roots of this plant are powerfully astringent. A decoction of them is given and used as a

gargle with success in cankers and ulcerated sore throats. We learn from an authentic source, that the late Dr. Hews, of Providence, held the root of this plant in high estimation in cases of aphthous states of fever accompanying dysentery, ulcerous sore throats, or *scarlatina anginosa*. He valued it as the greatest antiseptic he was acquainted with, and said he could administer it in cases where the bark was inadmissible.

Dr. William Baylies, of Dighton, in a communication to the Massachusetts Medical Society, makes favourable mention of this root from his experience in the ulcerated sore throat, as it appeared in that town in 1785 and 1786. This judicious physician observes, "Among the many medicines in high estimation with the common people, and used by them without the advice of the physician, I know of none worth the least consideration, excepting the marsh-rosemary, or, as it is commonly called, marsh root. This in a large dose operates as a vomit; in a smaller, proves a powerful expectorant; and from its sensible qualities, one would suppose it to possess considerable antiseptic powers. I am well assured it was the basis of a medicine used by a physician in Providence, with very great success in this complaint. It is undoubtedly of great efficacy, and deserves a more thorough investigation."

STYRAX BENZOIN. *Benjamin Tree.* The balsam, called benzoin.

This balsam, obtained by exudation, is in brittle masses composed of brown and white fragments; its smell is fragrant; it has little taste. It consists almost wholly of resin, and is therefore nearly entirely soluble in alcohol. It likewise contains a portion of a peculiar acid, which, as it exists in greater quantity in it than in any other vegetable matter, is named acid of benzoin (flowers of benzoin). It is obtained from it by sublimation; is in white, brilliant scales; retains the flavour of the benzoin; and, with acidity, has also a degree of pungency. Benzoin is rarely employed in medicine: its acid is used as an expectorant in asthma, in a dose of ten or fifteen grains, but it is probably a medicine of little power. It enters into the composition of the ammoniated and camphorated tinctures of opium.

Storax resembles benzoin in its virtues. It was formerly used as an expectorant, but is now little regarded.

SUB ACETIS CUPRI. *Sub Acelite of Copper. Ærugo. Verdegris.*

This substance is a kind of rust of copper, prepared by corroding the metal with vinegar. It is rarely employed internally, but being the basis of an empirical preventative of hydrophobia, the author of it asserts, that he is in the practice of giving not less than one hundred and eighty grains conjoined with half an ounce of calomel for one dose. And according to Dr. Parr, four drachms of this very active substance have been swallowed without any other inconvenience than the present vomiting, yet in smaller doses it excites the most violent symptoms, and often proves fatal. Applied externally it proves a mild escharotic, and is employed advantageously to callous edges, and fungous flesh in wounds, and to scorbutic ulcers of the mouth, and deserves to be tried in cancerous sores. Verdegris has been successfully applied to incipient chancres; by its acting as a caustic, and completely destroying the diseased surface. Equal parts of verdegris and powdered savine will effectually remove warts and other excrescences from the skin, and the same compound is the best application to promote the discharge from issues.

SUB BORAS SODÆ. *Sub Borate of Soda. Borax.*

This salt, consisting of boracic acid, united with soda, (the soda being slightly in excess) is brought from Thibet, where it is found in a native state. It is purified in Europe by crystalization; its taste is cool; it is soluble in eighteen parts of cold and six of hot water. It is decomposed by several of the acids.

The medicinal virtues of borax have not been sufficiently ascertained by experience; it is supposed to be, in doses of half a drachm or two scruples, diuretic, emmenagogue, and a promoter of delivery. A solution of borax in water, is the best of all applications, for healing aphthous crusts, or the thrush in the mouths and fauces of children; or it may be applied for the same purpose in the form of powder mixed with sugar. There is not perhaps a more balsamic, or useful application to sore nipples, or chopped lips and hands in winter, than a few grains of borax dissolved in warm water, with the addition of a little pure honey. There are strong reasons to

believe, that the virtues of borax are much greater than they are in general supposed to be; and that it may be more extensively used with advantage. As an astringent gargle in cases of salivation by mercury, and in other affections of the mouth and throat, a mixture of borax with water and honey is undoubtedly superior to every other.

Succinum. *Amber.*

This is a solid, brittle, bituminous substance, dug out of the earth, or found upon the sea shores; particularly along the coast of Polish Russia and Pomerania. It is of a white yellow, or brown colour; sometimes opaque, sometimes very clear and transparent. By distillation it affords a little acetous acid, an essential oil, and a peculiar acid, named from it, succinic.

Amber is regarded only for the empyreumatic oil and acid obtained from it.

Super Sulphas Aluminæ et Potassæ. *Super Sulphate of Alumina and Potass. Alum.*

This is a salt composed chiefly of argillaceous earth and sulphuric acid, the acid being in excess. It likewise contains a smaller portion of potass, and frequently of ammonia. It is found in a native state, or is prepared by exposing alum ores, which are native compounds of argillaceous earth and sulphur, to atmospheric air; the sulphur absorbing oxygen, forms sulphuric acid, which unites with the argillaceous earth, and the formation of the alum is completed by the addition of potass or ammonia. It is then obtained pure by crystalization.

This salt is in large transparent masses; it has a styptic taste, with a degree of sweetness. From the excess of its acid, it reddens the vegetable colours. It is soluble in eighteen parts of cold, and in less than two of boiling water. The variety termed roche or rock alum (alum rupeum) has a reddish colour, from the presence of a portion of iron, but its other properties are the same as those of common allum.

Alum, from its astringent power, is employed to check hæmorrhagies and serous evacuations; it is thus given in menorrhagia, leucorrhœa, and diabetes. It has likewise been used, though less frequently, in intermittent

fever, malignant small pox, and colica pictonum. Its dose is from five to fifteen grains. The addition of an aromatic is generally necessary, to prevent it from exciting nausea, when it is given in the solid form. The best form of administering it, however, is that of the alum whey, prepared by adding two drachms of powdered alum to a pint of hot milk; the dose of this is three or four ounces. In uterine hæmorrhage, and in diabetes, this whey taken to the quantity of three or four ounces, three times a day, has been attended with very favourable effects.

It is also used externally, in astringent and repellent lotions and collyria. But burnt alum taken internally, has been highly extolled in cases of colic. In such instances, when taken to the extent of a scruple for a dose, it has been said gently to move the belly, and give very great relief from the severe pain. Burnt alum is applied externally, as a gentle escharotic, to fungous ulcers.

Sulphas Barytæ. *Sulphate of Barytes. Ponderous Spar.*

This salt has been omitted in the list of the Materia Medica of the Edinburgh college; but they afterwards employ it for the preparation of the muriate of barytes. It is found in great abundance in many countries, either in a loose earthy form, or compact, or foliated, or striated, or acicular.

The foliated is in general the purest. Heated to redness with charcoal, it is converted into a sulphuret, and it may be decomposed either by boiling, or in a crucible, with the carbonates of potass and of soda. It contains about eighty four of barytes, and sixteen of sulphuric acid and water.

Sulphas Cupri. *Sulphate of Copper. Blue Vitriol.*

This article is made by stratifying plates of copper with the sulphur; and, on slow combustion, the sulphuric acid corrodes the copper: the metal is then boiled in water, till the saline particles be dissolved; when, after repeated solution, and subsequent evaporation, the whole is reduced to the chrystaline point.

The sulphate of copper has a strong, styptic, metallic taste, and is chiefly used externally as an escharotic for

destroying warts, callous edges, and fungous excrescences, as a stimulant application to ill-conditioned ulcers, and as a styptic to bleeding surfaces. Taken internally, it operates, in very small doses, as a very powerful emetic. Dr. Marryatt, an English physician, employed greatly to his satisfaction the vitriolum cupri as an emetic in phthisical cases. Dr. Senter, late of Newport, considered blue vitriol as one of the most safe and efficacious emetics in the same disease, joined with ipecacuan, that the materia medica affords; and advises from seven to ten grains of each, made up into pills, to be taken in the morning, fasting, without drinking any thing afterwards. The good effects of this prescription is amply attested by Dr. Thomas, author of Modern Practice, who has adopted it in many cases of incipient phthisis pulmonalis with infinite advantage. When given alone, the dose is from three grains to ten or fifteen, dissolved in two or three ounces of water. A vomiting is excited soon after it is received into the stomach, on which the patient may drink a pint of water. In phthisis pulmonalis the emetic is directed to be given every second or third day; and the same medicine is recommended in intermittent fever and epilepsy.

Sulphas Magnesiæ. *Sulphate of Magnesia. Sal Catharticus Amarus. Epsom Salt.*

This salt is found in mineral waters, whence it has been extracted, but is at present principally prepared by art, from the liquor remaining after the crystalization of muriate of soda (sea salt) from sea water, which holds a quantity of muriate of magnesia dissolved. It is commonly in needle-like crystals, and deliquescent; but when pure, it forms large, regular crystals, which are rather efflorescent. They are soluble in nearly an equal weight of water. Their taste is extremely bitter.

This salt is used as a purgative, in a dose of an ounce or more, dissolved in a large quantity of water. Though its taste is bitter, it has been remarked, that it remains better on the stomach than many other cathartics, especially when given in small repeated doses. Exhibited in this manner, it has been particularly recommended in ileus and colica pictonum. It is a mild and gentle purgative, operating with sufficient efficacy, and in general, with ease and safety, rarely occasioning any gripes, sick-

ness, or the other inconveniences with which purgatives of the resinous kind are too often accompanied. Some allege that this salt has a peculiar effect in allaying pain, as in colic, even independently of evacuation.

Epsom salt may be manufactured from the bittern, or bitter water which remains in the vats, after the crystalization of common salts by evaporation. The Rev. Mr. E. Briggs, of Chatham, county of Barnstable, is probably the only person who has hitherto successfully attempted the manufacture of this domestic article. He deposits vessels containing the bitter water (leaden vessels are preferable) in a cellar, or other cool place, out of the influence of the sun; this salt will collect upon the bottoms and sides of them, in very considerable quantities, having the appearance of half melted snow: in this state it is to be laid aside until the weather becomes cold, and then crystalized afresh. The salt thus procured, is found to be genuine sulphas magnesiæ, and equal in quality to any imported from Europe.

Sulphur Sublimatum. *Sublimed Sulphur. Flowers of Sulphur.*

Sulphur is a simple, inflammable substance, found in nature nearly pure, and likewise in combination with several of the metals. The sulphur of commerce is the produce of volcanic countries. It is naturally mixed with earthy matter, from which it is freed by sublimation.

Pure sulphur is of a light yellow colour; is insipid; has a faint smell, when rubbed or heated; is very fusible and volatile; and, when heated in atmospheric air, burns with a blue flame, and suffocating fumes. It is insoluble in water or alcohol, but is dissolved by oils, and combines with the alkalis, several of the earths, metals, and metallic oxides.

Pure sulphur loosens the belly, and promotes insensible perspiration: it seems to pass through the whole habit, and manifestly transpires through the pores of the skin, as appears from the sulphurous smell of persons who have taken it, and from silver in their pockets imbibing a blackish cast, which is the known effect of sulphurous fumes. It is a celebrated remedy against cutaneous diseases, both given internally, and externally applied. It has likewise been recommended in coughs, asthmas, and other disorders of the breast and lungs; and

particularly in catarrhs of the chronic kind. But it is probable, that the benefit derived from it in these cases, is principally, if not entirely, owing to its operation as a gentle laxative. And with this intention it is frequently used with great advantage in hæmorrhoidal affections, and many other diseases in which it is proper to keep the belly gently open. The dose is two or three drachms, in honey or molasses.

SULPHURETUM ANTIMONII. *Sulphuret of Antimony.*
Antimony. Stibium.

Antimony, in the modern nomenclature, is the name given to a peculiar metal. This metal is found in nature, most abundantly combined with sulphur; and to this ore, the name of Antimony was once generally given. To distinguish it from the pure metal, it is named Crude Antimony, or more properly, native sulphuret of antimony, the simple name, antimonium stibium, being appropriated to the metal itself.

The native sulphuret is of a gray blue colour; has a shining surface, and striated texture. To free it from the earthy matters with which it is mixed, when dug from the earth, it is fused. Its lustre is greater, the more it is purified. The proportions of its principles are various; sometimes they are nearly equal; in other specimens the quantity of metal is larger.

The pure metal obtained from the ore, is of a silvery, white colour, and plated texture, moderately hard, and very brittle; easily fusible, and even volatilized by a heat not very intense; oxidized by exposure to the air at a temperature moderately increased; and when oxidized, capable of combining with the greater number of the acids.

The antimonial metal is a medicine of the greatest power of any known substance; a quantity too minute to be sensible in the most delicate balance, is capable of producing violent effects, if taken dissolved, or in a soluble state.

Sulphureted antimony was employed by the ancients in collyria, against inflammations of the eyes; and for staining the eyebrows black. Its internal use does not seem to have been established till the end of the fifteenth century; and even at that time it was by many looked upon as poisonous. But experience has now fully evin-

ced, that it has no noxious quality, being often used, particularly in chronic eruptions; that some of its preparations are medicines of great efficacy; and, that though many of them be most violently emetic and cathartic, yet even these by a slight alteration or addition, lose their virulence, and become mild in their operation.

All the metallic preparations are uncertain, as it entirely depends on the state of the stomach, whether they have no action at all, or operate with dangerous violence. The sulphuret is exposed, though in a less degree, to the same objections.

The preparations of antimony do not exert any general stimulant operation, but are always directed in their action to particular parts, so as to occasion some sensible evacuation.

The principal general medicinal application of antimony has been for the cure of febrile affections. It is given so as to induce vomiting or purging, diaphoresis being also promoted; and, exhibited in this manner in the commencement of the disease, it has been considered capable of cutting short its progress.

In the latter stage of fever, where debility prevails, its use is inadmissible. Its efficacy has been in general ascribed to the evacuation it occasions: others have considered it, apparently with little reason, as exerting an action specific or peculiar in itself, and not explicable on the known effects it produces.

Antimonials have been found to have the same good effects in intermittents as in continued fevers, as well as in several of the phlegmasiæ and exanthemata; and even in several of the profluvia. The general effects of antimonials are, in small doses, diaphoresis and nausea; in large doses, full vomiting and purging. Some allege that antimonials are of more use in fever when they do not produce any sensible evacuation; as is said to be the case sometimes with James' powder. They therefore prefer this in typhus; and emetic tartar in synochus; in which there is the appearance at first of more activity in the system, and more apparent cause for evacuation. As an emetic, antimony is distinguished, for the certainty, extent, and permanence of its operation. The action it excites in the stomach is both more forcible, and continues for a longer time, than that from other emetics; and hence, it produces more complete evacuation, and occasions in a greater degree all those effects which

result from the action of vomiting. Its action is also less local. It is very generally extended to the intestinal canal, so as to produce purging; and very frequently to the surface of the body, so as to occasion diaphoresis, or sweat.

The virtues of antimony in the diseases of animals, are greatly extolled. Pigs, that have the measles, are at all times recovered by it, which proves it to be a great purifier of the blood. Horses, which have the running heels, and cannot be cured by the common methods, will generally be cured by this medicine, in a little time. A horse that is lean and scabby, and not to be fatted by any other means, will become fat on taking one drachm of crude antimony every morning for two months together.

Super-Tartris Potassæ. *Super-Tartrite of Potass. Crystals of Tartar. Cream of Tartar.*

Super-Tartris Potassæ Impurus. *Impure Super-Tartrite of Potass. Tartar.*

Tartar is a concrete saline matter, which separates from wines, after they have undergone complete fermentation: it adheres to the top and sides of the cask, in red, or whitish gray crystals, according to the colour of the liquor. In this state, it is called *crude tartar;* having a subacrid taste, and being with difficulty soluble in water.

By repeated solution, filtration, and crystalization, crude tartar may be *depurated*, or divested of all gross and impure particles, when it is called *crystals of tartar;* and, if these be reduced to powder, *cream of tartar.*

This salt is a mild, cooling, aperient, and laxative medicine: if half, or a whole ounce of it be taken in substance, with treacle or any other vehicle, it proves an effectual purgative. Farther, when dissolved in water, it affords, with the addition of sugar, an agreeable acidulated drink, which is of great service in ardent fevers; and likewise forms a pleasant beverage during the summer. It is also to be regarded as a valuable diuretic, and, as one of those, most efficacious in the treatment of the dropsy. It is given under two modes of exhibition, in which its effects are somewhat different. When given dissolved in a large quantity of water, to the extent of four or six drachms in a day, it acts simply as a diuretic; when given to the same extent, gradually increased, in

the form of an electuary, without the free use of diluents, along with a more or less diuretic effect, it acts as a hydragogue cathartic. The latter is the more usual, and perhaps, more successful mode of exhibition.

SWIETENIA FEBRIFUGA. *Swietenia.* The bark.

The bark of the wood of this tree is of a red colour internally; externally it is covered with a gray epidermis; it has an astringent bitter taste; it yields its active matter to water, by infusion or decoction, and by evaporation an extract is obtained, highly astringent. It was introduced as a substitute for Peruvian bark, and in India where the tree is a native, has been used as such with advantage. It has been ascertained by Dr. Roxburgh that it contains a much larger proportion of active, bitter, and astringent power, and to be more antiseptic than Peruvian bark. Its dose in substance is half a drachm.

SWIETENIA MAHAGONY. *Mahogany.* The bark.

This species of the same genus as the preceding, has similar qualities and virtues, being equally bitter and astringent. It has therefore been received into the Edinburgh Pharmacopœia, and may be employed to answer similar indications.

TAMARINDUS INDICA. *Tamarind Tree.* The preserved fruit, called tamarinds.

This tree grows both in the East and West Indies. The pod of the tree includes several large hard beans, with a brown viscid pulp, very acid. This pulp, mixed with the seeds and small fibres, and with a quantity of unrefined sugar, forms the tamarinds of the shops. Vauquelin found it to contain, beside the sugar mixed with it, citric and malic acids, acidulous tartrite of potass, free tartarous acid, gelatin, mucilage, and fibrous matter.

The pulp of tamarinds, beside its virtues as an acid, proves laxative, when taken to the extent of an ounce and an half. It is generally added to other cathartics, which are given in the form of infusion, with the view of promoting their operation, and covering their taste. It increases the action of the purgative sweets, cassia, and manna, and weakens that of the resinous cathartics.

By its acidity this fruit quenches thirst, and allays immoderate heat.

TANACETUM VULGARE. *Common Tansy.* The leaves and seeds.

Tansy is an indigenous perennial growing by road sides and the borders of fields, and is also cultivated in gardens. Its yellow blossoms appear in August. This plant possesses a warm bitter taste; it is deobstruent, not ungrateful to the palate, and some have had a favourable opinion of it in hysteric disorders. The leaves and seeds have been of considerable esteem as anthelmintics, and are given in doses of from one scruple to one drachm. The leaves are frequently used to give colour and flavour to pudding. And if fresh meat be rubbed with the plant, it will be effectually preserved from the attacks of the flesh fly.

TOLUIFERA BALSAMUM. *Balsam of Tolu Tree.* The balsam, called balsam of tolu.

This tree grows in Spanish America, and the balsam flows from incisions made in its bark, during the hot season; and is brought to us in gourd shells. It is of a yellowish brown colour, inclining to red: in consistence, thick and tenacious: by age it grows hard and brittle, without suffering any great loss from its more valuable parts. The smell of this balsam is extremely fragrant, somewhat resembling that of lemons; its taste warm and sweetish.

Lewis says that he has sometimes procured benzoic acid from it; it yields very little volatile oil, although it impregnates the distilled water strongly with its flavour. By dissolving a proper quantity of sugar in this water, a syrup is obtained, greatly superior to that prepared in the common way, with a decoction of the balsam.

This is the mildest of all the balsams. It has been esteemed as an expectorant, but its powers are very inconsiderable, and it is employed principally on account of its flavour. It possesses, however, all the virtues of the other balsams, and is more fragrant than most of them.

TORMENTILLA ERECTA. *Septfoil.* The root.

Tormentil is perennial, and found wild in woods and on commons; it has long slender stalks, with usually seven long narrow leaves at a joint; the root is for the most part crooked and knotty, of a blackish colour on the outside, and a reddish within. This root has an austere, styptic taste, accompanied with a slight kind of aromatic flavour; it is one of the most agreeable and efficacious of the vegetable astringents, and is employed with good effect in all cases where medicines of this kind are proper. It has been used in diarrhœa, under the form of decoction, and in intermittent fever in substance, in a dose from half a drachm to a drachm.

TRITICUM ÆSTIVUM. *Wheat.* The flour and starch prepared from the seeds.

Wheat flour consists principally of gluten, starch, albumen, and a sweet mucilage. It is the presence of gluten that characterises wheat flour; and on the due admixture of it with the other constituents, depends the superiority of wheat flour for baking bread. Bread is not only one of the most important articles of nourishment, but is also employed in pharmacy for making cataplasms, and giving form to more active articles. An infusion of toasted bread has a deep colour and pleasant restringent taste; and is an excellent drink in febrile diseases, and in nausea and debility of the stomach; and also in *cholera morbus:* examples are related of several cases of this kind cured by it, without the aid of any other medicine.

Starch, the fecula of wheat, forms a gelatinous solution when boiled with water, which is used as a demulcent. It is thus given as an enema in dysentery and diarrhœa, from irritation of the intestines, and is the common vehicle for giving opium in that form.

TUSSILAGO FARFARA. *Coltsfoot.* The leaves and flowers.

This grows wild in moist situations, producing yellow flowers in February and March: these soon fall off, and are succeeded by large, roundish leaves, hairy under-

neath; their taste is herbaceous, somewhat glutinous and subacrid. It is recommended in coughs, phthisis, and other disorders of the breast and lungs, and some use it in scrofula. It is chiefly directed to be taken with milk, and upon this, probably, more than on the tussilago itself, any benefit derived from it in practice is to be explained.

Ulmus Americana. *American Elm.* The inner bark.

We have two species of ulmus or elm in the United States. The red or *slippery* elm, or American rough leaved elm of Marshal, (ulmus rubra of Muhlenburgh) on account of its many valuable properties, deserves particular mention. It rises to the height of thirty feet, with a pretty strong trunk, dividing into many branches, and covered with a light coloured rough bark. The leaves are oblong, oval, and sharp pointed, unequally sawed on their edges, unequal at the base, very rough on their upper surface, and hairy underneath. The flowers are produced thick upon the branches, upon short, collected foot stalks, and are succeeded by oval, compressed membraneous seed vessels, with entire margins, containing one oval compressed seed. The inner bark, by infusion or gentle boiling in water, affords a great quantity of insipid mucous substance, that is applicable to a variety of important uses. Dr. Mitchell says it has been beneficially administered in catarrhs, pleurisies, and quinsies; it has been applied as a poultice to tumors, and as a liniment to chops and festers. [Letter to Dr. North, Amer. Museum, vol. 7th.]

The surgeons of our revolutionary army, and also those of general Wayne's army, who defeated the Indians in August 1794, experienced the most happy effects from the application of poultices of the elm bark to gun shot wounds, which were soon brought to a good suppuration, and to a disposition to heal. It was applied as the first remedy. When tendency to mortification was evident, this bark braised, and boiled in water, produced the most surprising good effects. After repeated comparative experiments with other emollient applications, as milk and bread, and linseed poultice, its superiority was firmly established. In old ill-conditioned ulcers, and in fresh burns, equal benefit was derived from it. The infusion of the bark was used with advantage as a diet drink, in

pleurisy, and catarrh, and also in diarrhœa and dysentery. Many of the above facts relative to the medicinal qualities of the red elm, were communicated, says the editor of the Domestic Encyclopœdia, by Dr. Joseph Strong, of Philadelphia, who served as surgeon in the western army; and adds, as a proof of the nutriment which it affords, that a soldier who lost his way supported himself for ten days upon this mucilage and sassafras. The editor of the above mentioned work, (vol. 2d, p. 448) proceeds to observe, that the red elm tree may be considered as a highly valuable addition to our stock of medicines, exclusively American, and ought to be carefully searched for by the medical gentlemen in the country, and preserved from the indiscriminate axe.

The inner bark of the slippery elm, or its mucilage, has been found by recent experience to be singularly beneficial when applied to chilblains, cutaneous eruptions, and various kinds of sores and ulcers; and there is much reason to believe, that its internal use in dysentery, consumption, &c. may be attended with greater advantage than is generally imagined. This tree certainly may be recommended to the particular regard of medical practitioners as a new, and domestic article of our Materia Medica, whose medicinal virtues will probably be found to merit a large share of confidence.

Urtica Dioica. *Common Nettle.* The plant.

This is a well known perennial weed. The leaves of the fresh plant stimulate, inflame, and raise blisters on the part of the skin which they touch. Hence, when a powerful rubefacient is required, stinging with nettles has been recommended. It has been said, sometimes to have succeeded in restoring sense and motion to paralytic limbs. M. Zannetini, in Italy, asserts, that the flowers and seeds of the common nettle, may, with efficacy be substituted for the Peruvian bark, in all febrile affections, especially in tertian and quartern agues. It operates more speedily than the bark; and in large doses, induces a lethargic sleep; the portion to be given should never exceed one drachm, and should be administered in wine, two or three times in twenty-four hours. The same cautions that are necessary in the use of Peruvian bark, are likewise to be observed in taking the seeds and flowers of the nettle.

VALERIANA OFFICINALIS. *Wild Valerian.* The root.

This plant is perennial, and grows wild in England. The root, which is the part used in medicine, consists of a number of slender fibres matted together, and attached to one head, of a brown colour, having a strong and unpleasant smell, and a warm bitter taste. Its active matter is extracted equally by water and by alcohol. Its infusion changes colour, on the addition of sulphate of iron. By distillation, water is impregnated with its flavour, but not with its taste. No essential oil is obtained.

Valerian is one of the principal modern antispasmodies, and is used with advantage in chorea, epilepsy, and hemicrania. Some recommend it as useful in procuring sleep, particularly in fever, even when opium fails; but it is principally useful in nervous and hysterical affections. The common dose is from a scruple to a drachm in powder; and in infusion, from one, to two drachms, three or four times in the day, which is increased gradually, as far as the stomach can bear it. Its unpleasant flavour is most effectually covered by a suitable addition of mace. Valerian is lately found in abundance on the borders of the Ohio river, not inferior to that imported from Europe.

VERATRUM ALBUM. *White Hellebore. Poke Root. Indian Poke.* The root.

This perennial plant grows in wet meadows and swampy places, often locally associated with skunk cabbage, which, early in the spring season it considerably resembles in appearance; the latter plant, however, has no stalk, while the hellebore sends forth one which attains to the height of two or three feet, terminating in June in a spike of flowers and seeds. The leaves are large and handsomely plaited. The root is bulbous, and when fresh has a nauseous, bitterish, acrid taste, burning the mouth and fauces. Snuffed up the nostrils in very small quantities, it excites violent sneezing, with a sense of heat and a copious discharge of mucus. The fresh root, in form of ointment or decoction, cures the itch. Crows are destroyed by boiling Indian corn in a strong decoction of the roots, and strewing it on the ground where these birds resort. The root when dried has no

particular smell, but a durable nauseous and bitter taste, and when powdered and applied to issues or ulcers, is said to produce griping and purging. Taken internally, it acts with extreme violence as an emetic and cathartic, and even in a small dose, has occasioned spasms, convulsions, and fatal consequences. The ancients sometimes employed this as a remedy in obstinate maniacal cases, and it is said, with success; but it has scarcely been regarded in modern practice. The American species very probably possesses all the properties of the foreign officinal root. It is undoubtedly a plant of highly active powers, meriting a particular investigation as an article of our Materia Medica. In fact, a new interest has lately been excited both in Europe and the United States, relative to the properties of white hellebore. It is even supposed to be the basis of the French specific remedy, called *Eau Medicinale d'Husson*, so highly famed for its almost infallible powers in the cure of gout, as to command the enormous price of from one to two crowns a dose. This remedy was discovered about forty years ago, by M. Husson, a French officer, who affirms it to be prepared from a plant whose virtues were before unknown in medicine; and it has long been celebrated in France and other parts of the European continent.

Dr. Edwin G. Jones, member of the Royal College of Physicians, London, after a thorough investigation of the subject, has, in a late publication, adduced the most unequivocal evidence of the superior powers of the *Eau Medicinale*, in curing the most distressing paroxysms of gout. His experience of its efficacy has been extensive, and among the numerous and remarkable instances to which he refers, are persons of distinguished rank and respectability, and whose cases were marked with symptoms of extreme severity. We have therefore the authority of Dr. Jones to assert, that this singular remedy exerts an extraordinary influence over the gout; and that it will safely, and almost immediately remove, often by a single dose, the severest paroxysms of that cruel disease, is sufficiently ascertained by a multitude of facts, collected from various sources of unquestionable authenticity. Scarcely an instance of its failure has yet been known to occur in practice. It is not, however, asserted, that it performs a radical cure of gout, eliminating the disease altogether from the system, but its operation is different from that of any remedy hitherto employed, it

removes the paroxysms as often and almost as soon as they occur. It in fact relieves the patient from agonizing pain, from all the miseries of long confinement, and restores him to his usual state of health, and the exercise of his limbs. It appears to be a powerful sedative, diminishing almost immediately the irritability of the system. Hence it allays pain, procures rest and sleep, reduces the pulse and abates fever.

This remedy has been extended to other diseases, and in several cases it has removed very severe acute rheumatisms in the same singular manner it does the gout.—The full dose of this medicine, according to Husson, and Dr. Jones, is about two drachms for an adult, mixed with an equal quantity of water, and taken on an empty stomach. Its operation may be promoted by some aromatic, or by peppermint, pennyroyal, or ginger tea. It in general occasions some nausea and vomiting, followed by bilious stools. A single dose will often carry off an attack, but it sometimes requires to be repeated in under doses. Some instances are recorded of its violent effects when exhibited in a dose disproportionate to the constitution, and particular circumstances. On some occasions much advantage has been derived from small doses taken every day for a considerable time.

The discovery of the substance from which this remedy is prepared would be an invaluable acquisition to our materia medica. The importance and popularity of the subject were incitements to various attempts for that purpose, and to the ingenuity of Mr. J. Moor, member of the Royal college of surgeons, London, the public are indebted for a composition, which if not identically the same, bears a strong resemblance to the *Eau medicinale* in smell, taste, and dose; and also in all its effects, so far as it has been tried in the cure of gout. The composition of Mr. Moor consists of wine of opium sydenham, one part, wine of white hellebore, three parts, made by infusing, for ten days, eight ounces of the sliced root of that plant, in two and half pints of white wine, and strained through paper. This compound, when exhibited in doses of from one to two drachms, has in a variety of instances effected a speedy cure of gouty paroxysms. There are indeed well attested examples where the most painful gouty affection has yielded to a single dose of about one drachm, and the instances of its failure have hitherto, it is believed, been more rare than can be said

of any other remedy. The employment of the composition of Mr. Moor, has also, in the hands of respectable physicians, been extended to acute rheumatism, and to some comatose affections, with the most decided advantage, and a perseverance in similar trials is strongly recommended. It has been observed, that beneficial effects may more certainly be expected when it excites some degree of nausea and vomiting, which an overdose like *Eau medicinale* seldom fails to induce.

We have hitherto been furnished with the additional evidence of every day's experience of the efficacy of Mr. Moor's composition in the cure of both gout and rheumatism, and no circumstance, it is believed, has yet occurred, tending to impair our faith in the analogy of its principles with the original preparation of M. Husson. Farther particulars respecting the character and properties of this interesting article, and the most eligible mode of preparation, are anxiously anticipated.

It has lately been discovered, that the root of white hellebore is employed as a valuable article in a new process for tanning leather.

VIOLA ODORATA. *March Violet.* The recent flower.

This plant is perennial, and found wild under hedges, and in shady places; but shops are generally supplied from gardens. Its flowers are so remarkable for their delightful odour, and their peculiar richness of colour, that they have given a name to both.

They impart their colour and flavour to aqueous liquors: a syrup made by this infusion has long maintained a place in the shops, and is said to be an agreeable and useful laxative for children; but is chiefly valued as a delicate test of the presence of uncombined acids or alkalis, the former changing its blue to a red, and the latter to a green colour.

VITIS VINIFERA. *The Vine.* The dried fruit, called raisin, and the fermented juice of the fruit, called Spanish white wine.

The vine grows in temperate situations in many parts of the world, and is cultivated very generally for the sake of its agreeable subacid fruit. Before they are ripe,

grapes are extremely harsh and acid, and by expression furnish a liquor which is called verjuice. It contains malic acid, super tartrite of potass, and extractive, and may be made to furnish wine by the addition of sugar. As the grape advances to maturity, the quantity of sugar increases, while that of malic acid diminishes; it, however, never disappears entirely. When thoroughly ripe, the grape is one of the most agreeable fruits. It is cooling, antiseptic, and nutritious; and, when eaten in considerable quantity, diuretic, and gently laxative. In inflammatory diseases, and all others where acids are indicated, they form an excellent article of diet.

Raisins, *uvæ passæ*, are grapes which have been carefully dried. By this means, not only the water they contain is dissipated, but the quantity of acid seems to be diminished. They become more saccharine, mucilaginous, and laxative, than the recent grape, but are less cooling.

Wine is the juice of the grape altered by fermentation. The numerous varieties of wine depend principally on the proportion of sugar contained in the must, and the manner of its fermentation. When the proportion of sugar is sufficient, and the fermentation complete, the wine is perfect and generous: If the quantity of sugar be too large, part of it remains undecomposed, as the fermentation is languid, and the wine is sweet and luscious; if, on the contrary, it be too small, the wine is thin and weak, and if it be bottled before the fermentation be completed, it will proceed slowly in the bottle, and, on drawing the cork, the wine will froth and sparkle in the glass, as for example, Champaigne. When the must is separated from the husk of the grape before it is fermented, the wine has little or no colour: these are called white wines. If, on the contrary, the husks are allowed to remain in the must while the fermentation is going on, the alcohol dissolves the colouring matter of the husks, and the wine is coloured: such are called red wines. Besides in these principal circumstances, wines vary very much in flavour. The red wines, are Port, which is strong and austere, and Claret, which is thinner and higher flavoured. Our white wines are called Madeira, Sherry, Lisbon, Malaga, and Hock. Of these the last is most acidulous, and Malaga the sweetest.

Wine, taken in moderate quantities, acts as a beneficial stimulus to the whole system. It promotes digestion,

increases the action of the heart and arteries, raises the heat of the body, and exhilarates the spirits. Taken to excess, it produces inebriety and stupor, which are often succeeded by headach, nausea, and diarrhœa, which last for several days. Habitual excess in wine debilitates the stomach, produces inflammation of the liver, weakens the nervous system, and gives rise to dropsy, gout, apoplexy, tremors, and cutaneous affections.

To convalescents, and in all diseases of general debility, and deficiency of the vital powers, wine is the remedy on which we must place our chief dependance; and when properly administered, its effects are often scarcely credible.

In typhus fever, attended by low delirium arising from debility, wine administered to the extent of one bottle or more in twenty-four hours, surprisingly mitigates the symptoms, and finally proves a sovereign remedy.

Its administration is regulated by the effects it produces; advantage being always derived from it when it renders the pulse more slow and firm; when the recurrence of delirium is prevented; when irritation is lessened, and sleep induced. If the pulse is quickened, and the countenance becomes flushed, if it excite thirst, increase the heat of the body, and occasion restlessness or delirium, it is obviously injurious, and its use should be suspended.

The wines prepared from other fruit than the grape are less spiritous and more acescent, and are hence inferior in tonic power. Fermented liquors, especially porter, are sometimes substituted for wine, where this is necessary from idiosyncracy, and their powers are somewhat modified by their other qualities, particularly by their bitterness, and by the pungency arising from their excess of carbonic acid. Their narcotic power is often greater than is proportioned to their vinous strength, owing to the addition of narcotic substances which they often receive in the preparation.

In the hands of Dr. Rush, and other eminent physicians in the United States, wine, aided by the use of bark, has frequently succeeded as a radical remedy in tetanus. Dr. Hosack, of New York, effected a cure in a case of lock-jaw, by administering wine alone to the extent of three gallons in four days. Dr. James Currie, of Liverpool, England, has also experienced the efficiency of wine in the same disease. He asserts that a

horse affected with lock-jaw, having been made the subject of experiment, was completely cured by the liberal use of wine alone.

Wine has been emphatically termed "the milk of the aged," but parents are seriously advised to beware of giving wine to their children *indiscriminately;* because to them it can be of service only when taken as a medicine; and those injudicious persons, who encourage young people to take wine *habitually* at their meals, are guilty of an abuse, which cannot be easily repaired by future abstinence.

Wine is often adulterated with lead or other deleterious drugs. In order to detect this fraud, take two drachms of cream tartar, and one drachm of liver of sulphur; put them into a two ounce phial of soft water. The phial must be kept well corked, and occasionally shaken for about ten minutes: when the powder has subsided, decant the clear liquor, and preserve it in a well stopped bottle. From sixteen to twenty drops of this liquid are to be dropped in a small glass filled with the suspected wine; and if the wine turns blackish or muddy, and deposits a dark coloured sediment, we may be certain it is impregnated with sugar of lead, or some other preparation of that metal equally destructive.

A Receipt to make an excellent American Wine, by Joseph Cooper, Esq. of Gloucester county, New Jersey.

"I put a quantity of the comb from which the honey had been drained, into a tub, and added a barrel of cider, immediately from the press; this mixture was well stirred and left for one night. It was then strained before a fermentation took place; and honey was added until the strength of the liquor was sufficient to bear an egg. It was then put into a barrel; and after the fermentation commenced, the cask was filled every day, for three or four days, that the filth might work out at the bunghole. When the fermentation moderated, I put the bung in loosely, lest stopping it tight might cause the cask to burst. At the end of five or six weeks, the liquor was drawn off into a tub; and the whites of eight eggs, well beat up, with a pint of clean sand, were put into it: I then added a gallon of cider spirit: and after mixing the whole well together, I returned it into the cask, which was well cleansed, bunged it tight, and placed it in a proper situation for racking off, when fine. In the month

of April following, I drew it off into kegs, for use; and found it equal, in my opinion, to almost any foreign wine: in the opinion of many judges, it was superior.

"This success has induced me to repeat the experiment for three years; and I am persuaded, that by using clean honey instead of the comb, as above described, such an improvement might be made, as would enable the citizens of the United States to supply themselves with a truly federal and wholesome wine, which would not cost a quarter of a dollar per gallon, were all the ingredients procured at the market price; and would have this peculiar advantage over every other wine, hitherto attempted in this country, that it contains no foreign mixture, but is made from ingredients, produced on our own farms."

XANTHORHIZA APIIFOLIA. *Shrub Yellow Root.* The stem and root.

Is a native plant of North Carolina, first brought by the late John Bartram, from that state, and planted in his garden at Kingsess, in the county of Philadelphia, where it has continued to flourish in a most luxuriant manner. It is denominated *Simplicissima* by Marshal, *Apiifolia* by L'Herretier, and *Marbosia*, by Mr. William Bartram, in honour of Mr. De Marbois. Xanthorhiza tinctoria is a more expressive name than any it has yet received.

Dr. Woodhouse has given an excellent account of this valuable plant, in the fifth volume of the Medical Repository of New York, from which the present extract is taken.

"The stems are three feet high, and somewhat thicker than a goose quill. The root is from three to twelve inches long, and about the diameter of a man's little finger, sending off numerous scions. The leaves are placed alternately, having long petioles and pinnated, terminating in an odd one; the follicles sessile, and lacerated deeply on their edges. The *peduncles* are branchy, and placed immediately beneath the first leaves, from which cause the flowers appear before the leaves, very early in the spring."

The stem and root are of a bright *yellow* colour, and possess a strong bitter taste.

The *xanthorhiza tinctoria* contains a gum and resin, both of which are intensely bitter; the resin is more abundant than the gum.

It imparts a drab colour to cloth, and a handsome yellow to silk; but the dye will not take on cotton or linen.

The watery extract of the grated roots mixed with alum, and added to Prussian blue, was first used by Mr. James Bartram for colouring plants, and the plumage of birds of a green colour. The green is far more lively and elegant than that made with gamboge and Prussian blue, which is generally used for painting in water colours, and stands well in the shade, but soon contracts a dull colour when exposed to a bright light, and to a high temperature. Various subjects coloured by this green, and inclosed in a book, were as lively after one year, as when first painted.

It is a strong and pleasant bitter, and preferable to all our native bitters. It sits easy on the stomach in the dose of two scruples.

The colour of the leaves appears to reside in a resin which is altered by the combined action of light and oxygen, by either of which, separately, it cannot be affected.

As the xanthorhiza is a strong and pleasant bitter, and very nearly allied to the columbo root, it promises to become a valuable addition to the American Materia Medica. It is preferable to all our native bitters. Dr. Woodhouse has often used the powdered stem and root of the xanthorhiza with success, in the dose of two scruples to an adult, in many of those diseases in which bitters are recommended, but generally combined with other remedies. It is a medicine which sits easy on the stomach, and produces no disagreeable effects.

XANTHOXYLUM CLAVA HERCULIS. *Prickley Yellow Wood. Yellow Hercules.* The wood and root.

Is a native of Jamaica, and other tropical countries, where it grows to the height of sixteen feet, and is about twelve inches in diameter. This straight tree somewhat resembles the common ash: the bark of the trunk is covered with numerous prickles; and the wood is of a bright yellow cast.

The wood of the xanthoxylum is chiefly employed for the heading of hogsheads, for bedsteads, and numerous other purposes: it also possesses remarkable medicinal virtues. The fresh juice expressed from the roots, affords certain relief in the painful disease, termed *dry bellyache*. This important fact was discovered in the West Indies,

by watching a female slave, who collected the root in the woods, and gave two spoonfuls of its juice to a negro, suffering under that cholic, at an interval of two hours. Such medicine occasioned a profound, but composed sleep of twelve hours; when all sense of pain, and other distressing symptoms, had vanished: the cure was completed, by giving an infusion of such expressed roots in water, by way of diet drink. Farther, the juice of the prickly yellow wood, when preserved in rum, and administered in doses not exceeding a wine-glassful, has effectually removed the most obstinate epileptic fits; but Dr. Henry has not mentioned the *manner* in which this preparation ought to be managed.

To the above observations of Dr. Willick, the following by Dr. Mease are added: *(Hom. Ency.)*

Two species grow in the United States.

1. *Xanthoxylum fraxinifolium*, or ash-leaved xanthoxylum, growing in Pennsylvania, and Maryland: and xanthoxylum calvis herculis, or prickly yellow wood, which grows in the more southern states.

The bark and capsules are of a hot acrid taste, and when a small quantity is chewed, powerfully promotes the flow of saliva. It is used in this way to relieve the toothach. A tincture of the same parts of the tree is a common country remedy for the chronic rheumatism.

In the West Indies a decoction of the bark is used with great success as an internal remedy, and also as a wash for foul ulcers, which it powerfully cleanses, and disposes to healthy granulations. The powdered bark is also mixed with the dressings. In the *London Medical and Physical Journal*, volume second, and following, there are several cases related of the efficacy of this medicine in the above disease.

Zincum. *Zinc.*

This is a semimetal, naturally obtained in a state of combination with different minerals, in England, Hungary, and other parts of the globe: it is of a whitish colour, nearly resembling that of lead, though it does not speedily tarnish.

Zinc exerts no sensible action on the system in its metallic state; it is employed, therefore, under various forms of preparation, where the medicinal virtues of the article will be described.

ALCORNOQUE. The wood and bark.

The alcornoque is a tree which grows on the Spanish main, South America. The wood is of a solid texture, ponderous, of a yellow colour, and gratefully bitterish taste, and sensibly stimulant. It has lately arrested some attention, though the natural history of the tree is at present involved in obscurity. It is inserted here chiefly in anticipation of its utility, as no intelligence relative to its character and properties has been obtained other than the contents of a printed paper communicated by a respectable medical friend, as follows:

THE ALCORNOQUE.

A REMEDY FOR DISEASES OF THE LUNGS AND LIVER.

From the Gazette de la Martinique.

St. Pierres, June 25, 1810.

Our readers will learn with as much surprise as satisfaction from the subjoined letter, the true and wonderful effects of the Divine Alcornoque.

If the extraordinary reputation this tree has acquired as an infallible specific in all diseases of the liver, and especially those of the lungs, reputed at the present moment incurable, be maintained with all its renown, it must certainly then be acknowledged, (without any need to anticipate the other beneficial properties it may possess,) as the first of plants, when valued from its healing effects, and will ever merit the first epithet bestowed on it of—Divine.

TO THE EDITOR OF THE MARTINIQUE GAZETTE.

SIR,

Persuaded that you would wish to give every publicity to whatever may be useful to suffering humanity, I hasten to make you acquainted with a wonderful discovery, for the cure of disorders, in which medicine has, to the present time, been found only a palliative.

Afflicted since eleven years with a pulmonary complaint, which the physicians said was tubercles in the

lungs, spitting blood and matter, in the most frightful manner, and having never received the smallest benefit from medicine, one of my friends, (Mr. Soliers) residing at the Caracas, having heard recited, two extraordinary cures, made by an Indian, spoke to me, on his arrival in this country, of the wonderful remedy that had been discovered; I procured, in consequence, one hundred pounds weight of the divine alcornoque. I used it, and in eleven days, I was perfectly cured. I hastened to administer it to different persons, who all found themselves recovered, from using it; among others, Messrs. Dufond, Mageeaux, du Lamentine, and Hillarie de St. Pierre.

I affix to this the receipt, written by Don Juan de Dios de Macias, merchant at Barcelona, one of those who was miraculously cured. Your countrymen will owe you an eternal obligation for its publication, and myself will always remain without bounds to my acknowledgments.

Sir, your very humble servant,

(Signed) P. Badollet.

Method which Don Juan de Dios de Macias adopted when he took the Divine Alcornoque.

In the first place, says he, I proceeded into a situation which, without being damp, was cool;—on my arrival I took about twelve ounces of the Alcornoque, which I had pounded in a mortar; I infused it in a regular quantity of pure water, until the following morning, when I took fasting, a glass full lukewarm, and continued to use it all day as my ordinary drink, but cold; at bed time, I took another glass lukewarm. I followed this method daily, solely observing to mix two spoonfuls of honey in the glasses, which I took warm morning and evening. I expended about three bottles of this drink per day, divided into eight or nine glasses.

If the persons using this remedy feel a great deal of heat, while adopting it, some barley water must be taken, but without any kind of acid in it.

As my disorder was occasioned by an abscess in the liver, which caused me frequently the most insupportable pains in the side, I had the Alcornoque pounded until it was reduced to powder. I then made a cataplasm or poultice, and applied it to my side, and the pains left me instantly.

When the receipt is used, milk, acids, spices, and in short, every thing of an irritating nature must be abstained from: biscuit ought to be used in preference to new bread. The daily food should be plain, boiled, or roasted, without any seasoning.

I suffered a year and a half the most excruciating pains. I consulted most of the physicians, both English and French, in the colonies, among others, M. Amic, of Gaudaloupe, and Dr. Gobert, of St. Pierres, Martinique, all of whom left me without hope, at length reduced to the most deplorable state, bringing away blood and matter. I adopted the receipt the Indian gave me, and in twelve days I was entirely cured, having discharged violently by the month, the whole of the abscess.

I omitted to mention, that after the cure, the patient should take some cooling medicines, and use, if possible, Asses, or mares milk, as the Alcornoque is extremely hot. The outer bark on the Alcornoque should be taken off, previous to being pounded and made into an infusion.

(Signed) Don Juan de Dios de Macias.

The Alcornoque is a tree which grows on the Spanish Main, the wood of which is very compact and heavy; the true meaning of the word signifies cork, although it differs essentially from this tree, as the cork, it is well known, is of a porous and light nature.

The following are the directions, taken chiefly from Paul Badollet, for administering the Divine Alcornoque.

The Indian by whom this remedy was discovered, directed that twelve ounces should be infused in cold water; but my experience induces me to believe that quantity too large, and I have adopted the following plan as the best.

Eight ounces of the Alcornoque may be given as a general dose; but for persons who are much reduced in strength, six ounces, and sometimes a less quantity will be sufficient. The wood and bark should be made fine with a rasp, or pounded, or made into thin shavings by a plane. Eight ounces should be put into two quarts of boiling water, and infused for twenty-four hours, taking care to keep the water hot, but not quite boiling. This may be done on the top of a close stove—Fresh water

must be added when a considerable quantity has evaporated.—When the decoction is completed, strain it through a coarse cloth.

Mix two spoonfuls of honey with half a pint of this decoction, and take that quantity *warm*, morning and evening; the remainder of the two quarts should be taken cold, and without honey, during the day.

As this remedy is sometimes heating, if the patient be thirsty, barley water may be taken at intervals for drink. In case of costiveness, give injections, and bathe the feet and legs with warm water, on going to bed, taking care to rub them after bathing, with a warm cloth or flannel, till they be perfectly dry.

If there be any pain in the side (and this is a very frequent attendant of diseases of the lungs and liver) apply a warm plaster of the powder which remains from the decoction, to the part; or, if shavings be used, pound them in a mortar, and heat them with a small quantity of boiling water, and apply them warm in a flannel to the side: this will seldom fail to remove the pain in a few hours.

During the use of the Aleornoque, the patient should attend strictly to diet. He may take plain boiled or roasted meat, but without pepper, salt, or any kind of spices: All acids must be avoided: Biscuit should be eaten in preference to fresh bread.

If the patient cannot take the decoction as drink during meals, he may be allowed a small quantity of white wine with water.

The use of this remedy is generally followed by a violent crisis,* which should be desired, rather than apprehended, with anxiety, as it frequently precedes an immediate cure.

It is advisable that the person who employs this remedy, should be attended by a physician, under whose judgment the doses may be increased or diminished, according to the condition of the patient. The convalescent should take for some time milk and water with barley boiled in it.

* The violent crisis is probably a copious discharge of matter from the part diseased.

CATALOGUE,

OF NEW ARTICLES THAT MERIT A PLACE IN THE APOTHECARIES SHOPS.

It was the observation of professor Cullen, one of the most celebrated writers on the Materia Medica, that any age has produced, That the writings on that subject are, for the most part, a compilation of mistakes and falsehoods. And he adds, that these errors arise from the obstinacy of old professors, and their blind attachment to theory, as well as the vanity of young physicians, being the authors of observations that are hastily made and dressed in the closet; and besides, many of the operations of nature have been falsely imputed to the effects of medicines, pretendedly founded on experience.* So distant are they from a true and faithful delineation of nature. Allied to these evils are the numerous frauds and sophistications of chemistry and pharmacy, and the reprehensible practice of administering nostrums or secret remedies, and other popular impositions, the fertile and disgraceful sources of empiricism. A knowledge of the medicinal powers, possessed by the indigenous vegetables, of which our own soil is so abundantly productive, should be deemed an acquisition of primary importance. However disparaging to medical erudition, it is but justice to confess, that we are indebted to the bold enterprise of illiterate pretenders for the discovery of some of our most active remedies. It is, therefore, extremely desirable, that our patriotic physicians and citizens should unite their exertions in the investigation of native substances, and institute such chemical analyses and experiments as will tend to elucidate their specific properties.

The following catalogue, consists of a selection of new articles, which merit a place in the apothecaries' shops; many of which should be cultivated in our gardens, and claim the attention of every American practitioner, that the importation of expensive foreign drugs may be superseded:

* Vid Cullen's Treatise on the Materia Medica. Vol. I

Acorus Calamus.
Actea Spicata.
Agrimonia.
Aralia Spinosa.
Arbutus Uva Ursi.
Arum Americanum.
Arum Triphyllum.
Asclepias Decumbens.
Asculus Hippocastanum.
Cassia Marilandica.
Convolvulus Panduratus.
Cornusflorida.
Cornus Sericea.
Datura Stramonium.
Eupatorium Perfoliatum.
Eupatorium Pilosum.
Frasero Carolinensis.
Geranium Maculatum.
Geum Urbanum.
Hamamelis.
Heracleum Sphondilium.
Iris Pseudacorus.
Juglans Cinerea.
Juniperus Virginiana.
Kalmia Latifolia.
Kalmia Angustifolia.
Leonurus Cardiaca.
Liriodendron tulipifera.
Lobelia Inflata.
Lytta Vittata.
Melia Azedarach.
Myrica Cerifera Humilis.
Nigella.
Phytolacca Decandra.
Prinos Verticillatus.
Prunus Virginiana.
Quercus Robur.
Rhus Toxicodendron.
Rumex Acutus.
Rumex Aquaticus.
Rumex Crispus.
Sanguinaria Canadensis.
Salix Alba.
Salix Latifolia.
Sentellaria Lateriflora.
Secale Cornutum.
Sophora tinctoria.
Statice Limonium.
Tanasetum Vulgare.
Ulmus Americana.
Veratrum Album.
Xanthorhira Apiifolia.
Xanthoxylum Clava Herculis.

COLLECTION AND PRESERVATION

OF

SIMPLES.

Each of the kingdoms of nature furnishes articles which are employed in medicine, either in their natural state, or after they have been prepared by the art of pharmacy.

In collecting these, attention must be paid to select such as are most sound and perfect, to separate from them whatever is injured or decayed, and to free them from all foreign matters adhering to them.

Those precautions must be taken which are best fitted for preserving them. They must in general be defended from the effects of moisture, too great heat, or cold, and confined air.

When their activity depends on volatile principles, they must be preserved from the contact of the air as much as possible.

As the vegetable kingdom presents us with the greatest number of simples, and the substances belonging to it are the least constant in their properties, and most subject to decay, it becomes necessary to give a few general rules for their collection and preservation.

Vegetable matters should be collected in the countries where they are indigenous; and those which grow wild, in dry soils, and high situations, fully exposed to the air and sun, are in general to be prefered to those which grow in moist, low, shady, or confined places.

Roots which are annual, should be collected before they shoot out their stalks or flowers; biennial roots in the harvest of the first, or spring of the second year; perennial, either in the spring before the sap has begun to mount, or in harvest, after it has returned.

Those which are worm eaten or decayed are to be rejected. The others are immediately to be cleansed with a brush and cold water, letting them lie in it as short time as possible; and the fibres and little roots, when not essential, are to be cut away.

Roots which consist principally of fibres, and have but a small tap, may be immediately dried. If they be juicy,

and not aromatic, this may be done by heat, not exceeding 100° of Fahrenheit; but if aromatic, by simply exposing them, and frequently turning them in a current of cold, dry air: If very thick and strong, they are to be split or cut into slices, and strung upon threads; if covered with a tough bark, they may be peeled fresh, and then dried. Such as lose their virtues by drying, or are directed to be preserved in a fresh state, are to be kept buried in dry sand.

No very general rule can be given for the collection of herbs and leaves, some of them acquiring activity from age, and others, as the mucilaginous leaves, from the same cause, losing the property for which they are officinal. Aromatics are to be collected after the flower buds are formed; annuals, not aromatic, when they are about to flower, or when in flower; biennials, before they shoot; and perennials, before they flower, especially if their fibres become woody.

They are to be gathered in dry weather, after the dew is off them, or in the evening before it falls, and are to be freed from decayed, withered, or foreign leaves. They are usually tied in bundles, and hung up in a shady, warm, and airy place; or spread upon the floor, and frequently turned. If very juicy, they are laid upon a sieve, and dried by a gentle degree of artificial warmth.

Sprouts are collected before the buds open; and stalks are gathered in autumn.

Barks and woods are collected when the most active part of the vegetables are concentrated in them, which happens in spring and in autumn. Spring is prefered for resinous barks; and autumn for the others, which are not resinous but rather gummy. Barks should be taken from young trees, and freed from decayed parts, and all impurities.

The same rules direct the collection of woods; but they must be taken from very young trees. Among the resinous woods, the heaviest, which sink in water, are selected. The alburnum is to be rejected.

Flowers are collected in clear, dry weather, before noon, but after the dew is off; either when they are about to open, or immediately after they have opened. Of some the petals only are preserved, and the colourless claws are even cut away; of others, whose calyx is odorous, the whole flower is kept. Flowers which are too small to be pulled singly, are dried with part of the stalk: These are called heads or tops.

Flowers are to be dried nearly as leaves, but more quickly, and with more attention. As they must not be exposed to the sun, it is best done by a slight degree of artificial warmth.

Seeds and fruits, unless when otherwise directed, are to be gathered when ripe, but before they fall spontaneously. Some pulpy fruits are freed from their core and seeds, strung upon threads, and dried artificially. They are in general best preserved in their natural coverings, although some, as the colocynth, are peeled; and others, as the tamarind, preserved fresh. Many of these are apt to spoil, or become rancid; and as they are then not fit for medical use, no very large quantity of them should be collected at a time.

The proper drying of vegetable substances is of the greatest importance. It is often directed to be done in the shade and slowly, that the volatile and active particles may not be dissipated by too great heat; but this is an error, for they always lose infinitely more by a slow, than by a quick drying. When, on account of the colour, they cannot be exposed to the sun, and the warmth of the atmosphere is insufficient, they should be dried by an artificial warmth, less than 100° Fahrenheit, and well exposed to a current of air. When perfectly dry and friable, they have little smell; but after keeping for some time, they attract moisture from the air, and regain their proper odour.

The boxes and drawers in which vegetable matters are kept, should not impart to them any smell or taste; and more certainly to avoid this, they should be lined with paper. Such as are volatile, or of delicate texture, or subject to suffer from insects, must be kept in well covered glasses. Fruits and oily seeds, which are apt to become rancid, must be kept in a cool and dry, but by no means a warm or moist air.

Oily seeds, odorous plants, and those containing volatile principles, must be collected fresh every year. Others, whose properties are more permanent, and not subject to decay, will keep for several years.

Vegetables collected in a moist and rainy season, are in general more watery, and apt to spoil. In a dry season, on the contrary, they contain more oily and resinous particles, and keep much better. They ought to be collected annually, and if they have been kept for a longer period, should be rejected.

PART III.

PREPARATIONS AND COMPOSITIONS.

The practice of pharmacy is regulated by the different pharmacopœias, and these vary in no inconsiderable degree in the mode of conducting the process, and even with respect to the proportion of the active ingredients which constitute some of the compositions, as directed by the respective colleges. Having taken the Massachusetts pharmacopœia, as the basis of this part of the work, which accords also with that of the Edinburgh college, it seems inexpedient to introduce the analogous preparations of the London and Dublin pharmacopœias. I have not, however, neglected altogether to notice in course, such essential differences as appear calculated to lead to practical error and embarrassment. I have also selected from Dr. Powel's late translation of the London pharmacopœia, a few officinal preparations on account of their obvious utility.

A system of pharmacy is thus presented amply adequate to all the purposes of American physicians, divested of that tedious repetition which is unavoidable when the processes of all the pharmacopœias are regularly introduced.

PART III.

PREPARATIONS AND COMPOSITIONS.

CHAPTER I.

SULPHUR.

Sulphur Sublimatum Lotum. ***Washed Sublimed Sulphur.*** ***Washed Flowers of Sulphur.**

Take of

Sublimed sulphur, one pound,
Water, four pounds.

Boil the sulphur for a little while in the water, then pour off this water, and wash away all the acid by affusions of cold water; lastly, dry the sulphur.

A small portion of sulphur in its sublimation sometimes suffers oxidation from the air of the chamber into which it is sublimed, and hence acquires a slight acidity, which the present process is designed to remove. This is so rarely the case, however, that it is one perhaps unnecessary.

* The translation of the ancient names are added in Roman letters. Tables are annexed containing the ancient names, with their synonymies, and the systematic names with their synonymies.

CHAPTER II.

ACIDS, ALKALIS, EARTHS, AND THEIR COMPOUNDS.

The term salt has long been employed in chemical language to denote an extensive order of substances; yet it is difficult to assign to it a precise definition, or to distinguish these by characters at once sufficiently comprehensive and appropriate.

Those properties which have been assigned as the characters of the order are not possessed by every substance which in chemical arrangement is regarded as saline, but on the contrary the exceptions are very numerous. The characters of this order therefore are now drawn rather from the chemical composition of the substances arranged under it. It is thus understood as comprehending the acids, the alkalis, and the compounds resulting from the combination of acids with alkalis, earths, and metallic oxides. The acids and alkalis are named simple or primitive salts; the others secondary, or more commonly neutral salts, as in general the properties of the acid, and of the alkali, earth, or metal of which they are formed, are neutralized or lost.

Acidum Sulphuricum Dilutum. *Diluted Sulphuric Acid.* Diluted Vitriolic Acid.

Take of

Sulphuric acid, one ounce,
Water, seven ounces.

Mix them gradually.

The most simple form, in which sulphuric acid can be employed internally, is that in which it is merely diluted with water; for which it has a great attraction: and their bulk, when combined, is less than that of the water and acid separately. At the same time there is a very

considerable increase of temperature produced, which is apt to crack glass vessels, unless the combination be very cautiously made; and for the same reason, the acid must be poured into the water, not the water into the acid. Distilled water is preferable to spring water.

This preparation was formerly called weak spirit of vitriol, and has been considered as a useful astringent, taken to the extent of thirty drops; but its medicinal properties have already been mentioned under the article Acidum Sulphuricum, in the Materia Medica.

Acidum Nitrosum. *Nitrous Acid.* Glauber's Spirit of Nitre.

Take of

Nitrate of potass in coarse powder, or bruised, two pounds,
Sulphuric acid, sixteen ounces.

Having put the nitrate of potass into a glass retort, pour upon it the sulphuric acid, and distill it in a sand bath, with a heat gradually increased, until the iron pot begin to be red hot.

The specific gravity of this acid is to that of distilled water as 1550 to 1000.

In this process, the sulphuric acid, by its superior affinity, combines with the potass of the nitre to form sulphate of potass, while the nitric acid is separated, and is not only converted into vapour by the application of the heat to the retort, but is also partially decomposed. A portion of oxygen escapes in a gaseous form, and the nitric oxide gas combines with the nitric acid; so that the liquor condensed in the receiver is nitrous, and not nitric acid.

Acidum Nitrosum Dilutum. *Diluted Nitrous Acid.* Aqua Fortis Tenuis.

Take of

Nitrous acid,
Water, equal weights.

Mix them, taking care to avoid the noxious vapours.

In combining nitrous acid with water, the greater part of the nitrous gas of the former is disengaged. The diluted acid is employed in a number of the chemical processes of the Pharmacopœia.

Acidum Nitricum. *Nitric Acid.* Aqua Fortis.

Take of

Nitrous acid, any quantity.

Pour it into a retort, and having adapted a receiver, apply a very gentle heat, until the reddest portion shall have passed over, and the acid which remains in the retort shall have become nitric acid.

By the heat applied, the nitrous gas contained in the nitrous acid, and which gives to it the yellow colour and highly fuming property, is expelled, and condenses in the receiver, combined still with a small portion of acid.

The nitric acid remains colourless. It is applied to the same purposes as the nitrous. Little or no difference can exist between them in medicinal powers, but the nitric is perhaps more uniform in strength.

These acids, the nitrous and nitric, have been long employed as powerful pharmaceutic agents. They are next in strength to the sulphuric, and dislodge all others from alkaline salts or earths. Under the name of *aqua fortis*, the nitrous acid of a certain strength has long been employed for various purposes in the arts and manufactures. Great caution should be observed in the use of this powerful liquid. In casualties where a person has, by mistake, swallowed a portion of *aqua fortis*, luke warm water ought to be drunk in the greatest possible quantity, even to the amount of several gallons, to weaken the causticity of the poison, and to avert the imminent danger of suffocation. Next, a solution of half an ounce of salt of tartar, or clear pearl ashes, in one pint of water, should be taken in about six or eight draughts; and as the effervescence thus occasioned in the stomach, greatly tends to weaken that organ, it will be necessary to make use of more water, and other diluent, oily, or mucilaginous drinks.

The use of the nitrous and nitric acids in medicine, has lately been considerably extended.

In the state of vapour, they have been used to destroy contagion in jails, hospitals, ships, and other places where the accumulation of animal effluvia is not easily avoided. The fumigating such places with the vapour of nitrous acid has certainly been attended with success; but we have heard that success ascribed entirely to the ventilation employed at the same time. Ventilation may cer-

tainly be carried so far, that the contagious miasmata may be diluted to such a degree, that they shall not act on the body; but to us it appears no less certain, that these miasmata cannot come in contact with nitric acid or oxymuriatic acid vapour, without being entirely decomposed, and completely destroyed. It is, besides, applicable in situations which do not admit of sufficient ventilation; and where it is, the previous diffusion of acid vapours is an excellent check upon the indolence and inattention of servants and nurses, as by the smell we are enabled to judge whether they have been sufficiently attentive to the succeeding ventilation. Nitric acid vapour, also, is not deleterious to life, and may be diffused in the apartments of the sick, without occasioning to them any material inconvenience. The means of diffusing it are easy. Half an ounce of powdered nitre is put into a saucer, which is placed in a pipkin of heated sand. On the nitre two drachms of sulphuric acid are then poured. The fumes of nitric acid immediately begin to rise. This quantity will fill with vapour a cube of ten feet; and by employing a sufficient number of pipkins, the fumes may be easily made to fill a ward of any extent. After the fumigation, ventilation is to be carefully employed. For introducing this practice, Dr. Carmichael Smyth has received from the British parliament a reward of five thousand pounds.*

* It is remarkable, that, while Dr. C. Smyth insists upon the efficacy of the *nitrous vapour*, M. Guyton de Morveau is equally positive, that the suffocating fumes of the *muriatic acid* are the most certain destroyers of contagion. The plans both of Morveau and Smyth, founded on the principle of the alkaline nature of contagion, are in direct opposition to the theory of *septic acid*, suggested by the ingenious Dr. Mitchill of New-York. The great efficacy of gaseous fumigations by the mineral acids in destroying contagion, has been clearly demonstrated and the practice firmly established. It may be of little importance whether the nitrous, or the muriatic acid be employed, as the powers of both are extensive and certain. When the muriatic is prefered, one pound of muriate of soda, is put into an earthern vessel, and a small quantity of *sulphuric acid* is poured over it until the whole salt is moistened. If a gentle heat be applied, a larger quantity of vapour will be extricated. In every hospital, garrison, jail, ship, or any other crowded place, or even in private dwellings, on the appearance of any infectious disorder, we should not fail to advise the employment of these acid fumigations.

The internal use of these acids has also been lately much extended. In febrile diseases, water acidulated with them forms one of the best antiphlogistic and antiseptic drinks we are acquainted with. Hoffman and Eberhard long ago employed it with very great success in malignant and petechial fevers; and in the low typhus, which frequently rages among the poor in the suburbs of Edinburgh, it has been repeatedly given with unequivocal advantage. In the liver complaint of the East Indies, and in syphilis, nitric acid has also been extolled as a valuable remedy, by Dr. Scott, and the evident benefits resulting from its use in these complaints, has given rise to a theory, that mercury only acts by oxygenizing the system. It is certain, that both the primary and secondary symptoms of syphilis have been removed by the use of these acids, and that the former symptoms have not returned, or been followed by any secondary symptoms. But in many instances they have failed, and it is doubtful if ever they effected a permanent cure, after the secondary symptoms appeared. Upon the whole, the opinions of Mr. Pearson on this subject, lately agitated with so much keenness, appear to us so candid and judicious, that we shall insert them here. He does not think it eligible to rely on the nitrous acid in the treatment of any one form of the lues venerea; at the same time, he by no means wishes to see it exploded as a medicine altogether useless in that disease. When an impaired state of the constitution renders the introduction of mercury into the system inconvenient, or evidently improper, the nitrous acid will be found, he thinks, capable of restraining the progress of the disease, while at the same time, it will improve the health and strength of the patient. On some occasions, this acid may be given in conjunction with a mercurial course, and it will be found to support the tone of the stomach, to determine powerfully to the kidneys, and to counteract in no inconsiderable degree the effects of mercury on the mouth and fauces.

The common method of giving the nitric acid at first, is to mix one drachm with a pint of water, the mixture being sweetened with simple syrup. This quantity is to be taken at different times, in the course of twenty-four hours, through a glass tube or quill, which is used to prevent the teeth from being injured. If no inconvenience is felt, the dose of the acid may be increased to two, and even in certain cases to three drachms.

ACIDUM MURIATICUM. *Muriatic Acid.* Spirit of Sea Salt.

Take of

Muriate of soda, two pounds,
Sulphuric acid, sixteen ounces,
Water, one pound.

Let the muriate of soda be kept at a red heat for some time in an iron vessel, and after it has cooled, put it into a retort; then pour upon the muriate of soda, the acid mixed with the water and allowed to cool. Lastly, distill in a sand bath, with a moderate fire, as long as any acid is produced.

The specific gravity of this acid is to that of distilled water, as 1170 to 1000.

This process is an example of single affinity. The sulphuric acid combines with the soda of the muriate of soda, and the muriatic acid is disengaged. It combines with the watery vapour, and is thus easily condensed. It has generally a yellowish tinge, from the presence of a small quantity of iron, from which it can be freed by a second distillation.

The spirit of sea salt is the weakest of the mineral acids, but stronger than any of the vegetable. In its effects on the animal economy, and the mode of its employment, it coincides with the acids already mentioned, which almost proves that they do not act by oxygenizing the system, as the muriatic acid cannot be disoxygenized by any substance or process with which we are acquainted. This preparation is sometimes given, properly diluted, as an antiphlogistic, aperient, and diuretic, from ten to sixty or seventy drops.

Dr. Reich of Erling in Franconia, has cured the malignant putrid fevers, by the liberal use of mineral acids, and particularly the muriatic, or spirit of sea salt. Sir William Fordyce, also recommends it as the best remedy in all putrid diseases of the worst kind; in petechial, camp, and jail distempers, as well as the malignant sore throat, small pox, and plague.

Dr. Reich directs a mixture of from one drachm to half an ounce of the acid, eight ounces of water and two of syrup; the patient to take a table spoonful or more every hour or two hours. But in time of great danger,

from forty to one hundred drops, properly diluted, may be given at once, and such doses often repeated. The internal exhibition, however, of this powerful remedy, is liable to many serious objections, which must ever prevent its general adoption. But it may in all cases be safely applied in the form of liniments, fomentations, and baths: thus a very large and much larger proportion than by swallowing it, may be daily, nay, hourly introduced into the system, especially in the earlier stages of the disorder, before the patient's strength is too much exhausted.

Dr. Robert Thomas, author of the Modern Practice of Physic, observes, that the effects of the mineral acids, more particularly the muriatic, in all febrile diseases of a malignant nature are truly great, and from employing them for several years, in all such cases, his practice has been attended with the most decided success, and he cheerfully vouches for their efficacy. He prescribes to adult patients ten or twelve drops of the muriatic acid, guarded with five drops of tinctura opii, with an infusion of columbo, after proper evacuations have been made, and increases the dose to eighteen or twenty drops every four hours.

Acidum Acetosum Destillatum. *Distilled Acetous Acid.* Distilled Vinegar.

Let eight pounds of acetous acid be distilled in glass vessels with a gentle heat. The two first pounds which come over, being too watery, are to be set aside; the next four pounds will be the distilled acetous acid. The remainder furnishes a still stronger acid, but too much burnt by the fire.

Vinegar, as it is produced by fermentation, consists of acetous acid, largely diluted with water, and mixed with a number of other substances. From these it is purified by distillation, but it is still largely diluted with water, as the pure acid is not even so volatile as water; and, in general, it receives from the distillation somewhat of an empyreumatic odour. The process should be conducted in glass vessels, as directed in the pharmacopœia; as, from metallic ones, the acid would receive an impregnation that might prove noxious.

Distilled acetous acid is chiefly employed as a solvent of some vegetable substances, and in making some of the salts.

ACIDUM ACETOSUM FORTE. *Strong Acetous Acid.*

Take of

Sulphate of iron dried, one pound,
Acetite of lead, ten ounces.

Having rubbed them together, put them into a retort, and distill in a sand bath with a moderate heat, as long as any acid comes over.

The London pharmacopœia directs this acid to be procured by the distillation of verdigris, and it is somewhat uncertain whether the two products differ essentially from each other, and whether these concentrated acids differ except in strength, from the diluted acetous acid.

These strong acids are principally used as powerful stimulants, applied to the nostrils in languor and asphyxia. Their odour is pungent and grateful. They are capable of acting as powerful rubefacients.

ACIDUM BENZOICUM. *Benzoic Acid.* Flowers of Benzoin.

Take of

Benzoin, twenty-four ounces,
Carbonate of soda, eight ounces,
Water, sixteen pounds.

Triturate the benzoin with the carbonate, then boil in the water for half an hour, with constant agitation, and strain. Repeat the decoction, with other six pounds of water, and strain. Mix these decoctions, and evaporate, until two pounds remain. Filter anew, and drop into the fluid, as long as it produces any precipitation,

Diluted sulphuric acid.

Dissolve the precipitated benzoic acid in boiling water; strain the boiling solution through linen, and set it aside to crystalize. Wash the crystals with cold water, dry and preserve them.

The benzoic acid when properly prepared has an agreeable taste and fragrant smell. It totally dissolves in alcohol, and likewise by the assistance of heat in water; but separates again from the latter upon the liquors growing cold, shooting into saline spiculæ, which unite together in irregular masses. By the mediation of sugar,

flowers of benzoin remain suspended in cold water, and thus form an elegant balsamic syrup. Some have held them in great esteem as pectoral and sudorific, in the dose of half a scruple or more; but at present they are rarely used, except as an ingredient in the composition of the paregoric elixir of the pharmacopœia.

OLEUM SUCCINI ET ACIDUM SUCCINICUM. *Oil of Amber and Succinic Acid.* Salt and Oil of Amber.

Take of

Amber reduced to powder, and of pure sand, equal weights.

Mix them, and put them into a glass retort, of which the mixture may fill one half; then adapt a large receiver, and distill in a sand bath, with a fire gradually increased. At first a watery liquor will come over, with some yellow oil; then a yellow oil with an acid salt, and lastly, a reddish and black coloured oil. Pour the liquor out of the receiver, and separate the oil from the water. Press the salt collected from the neck of the retort and sides of the receiver, between folds of blotting paper, to free it from the oil adhering to it; then purify it by solution in warm water and crystalization.

We are not acquainted with any experiments which determine whether the succinic acid exists as such in the amber, or whether it be a product of the decomposition of the amber by the action of heat, for in the process employed for obtaining succinic acid, the amber is completely decomposed.

Succinic acid, formerly salt of amber, has a penetrating subastringent acid taste. It dissolves both in water and in rectified spirit; though not readily in either, and scarcely at all in the latter without the assistance of heat. It effervesces with alkalis, and forms with them neutral compounds much resembling those composed of the same alkalis and vegetable acids. It was formerly in repute as an aperient, diuretic, and antihysteric, but in modern practice it is little regarded.

The oil of amber is sometimes employed externally as a stimulant, and internally as an antispasmodic, but is also falling into disuse. A process is ordered in the pharmacopœia for its purification.

AQUA ACIDI CARBONICI. *Water of Carbonic Acid.*
Water impregnated with fixed Air.

Take of

Water, six pounds; place this in the middle part of a Nooth's apparatus, and expose it to a stream of carbonic acid gas arising from
Carbonate of lime, in powder,
Sulphuric acid, each three ounces,
Water, three pounds, gradually and cautiously mixed.

If a larger quantity of the liquor be required, the apparatus of Dr. Woulfe is preferable.

In this and similar preparations, where carbonic acid gas is combined with liquids, the liquor is better in proportion to the coldness of the air, and to the pressure to which it is subjected. It should be preserved in glass vessels well closed, and should not be exposed to any high temperature.

In this process the carbonic acid is separated from the carbonate of lime by the superior affinity of sulphuric acid. As it is disengaged, it assumes a gaseous form, and would be dissipated in the atmosphere, if it were not made to pass through water, which, at a medium temperature, is capable of absorbing about an equal bulk of this gas, and, by the assistance of pressure, a much greater proportion.

Various contrivances have been made for this purpose. Of these the most easily managed, and most convenient for general use, is the apparatus of Nooth, and for larger quantities that of Woulfe, or some modification of it. By the proper application of pressure, Mr. Paul is able to impregnate water, with no less than six times its bulk of carbonic acid gas.

Water, impregnated with carbonic acid, sparkles in the glass, has a pleasant acidulous taste, and forms an excellent beverage. It diminishes thirst, lessens the morbid heat of the body, and acts as a powerful diuretic. It is also an excellent remedy in increased irritability of the stomach, as in advanced pregnancy; and it is one of the best anti-emetics we possess.

AQUA POTASSÆ. *Solution of Potass.* Water of Potass. Caustic Ley.

Take of

Lime recently burnt, eight ounces,
Carbonate of potass, six ounces.

Throw the lime into an iron or earthern vessel, with twenty-eight ounces of warm water. After the ebullition is finished, instantly add the salt; and having thoroughly mixed them, cover the vessel till they cool. When the mixture has cooled, agitate it well, and pour it into a glass funnel, whose throat must be stopt up with a piece of clean rag. Let the upper mouth of the funnel be covered, while the tube of it is inserted into another glass vessel, so that the solution of potass may gradually drop through the rag into the lower vessel. When it first gives over dropping, pour into the funnel some ounces of water; but cautiously, so that the water may swim above the matter. The water of potass will again begin to drop, and the affusion of water is to be repeated in the same manner, until three pounds have dropped, which will happen in the space of two or three days; then by agitation mix the superior and inferior parts of the liquor together, and put it up in a well stopt phial.

The principle of mildness in all alkaline salts, whether fixed or volatile, vegetable or fossil, is very evidently carbonic acid. But quick lime has a stronger attraction for the acid than any of the salts. Of course, when lime comes in contact with carbonate of potass, as in the above process, the carbonic acid quits the potass to unite with the lime, and the results of the mixtures are potass and carbonate of lime. Now as the carbonate of lime is insoluble in water, and the potass is very soluble, they may be separated by filtration. The method of filtrating through sand as employed by Dr. Black, is preferable to any other.

The caustic ley is to be considered as a solution of pure alkali in water. It is colourless, and will neither effervesce with acids, nor form a precipitate with carbonate of potass. The solution of caustic potass, under various names, has at different times been celebrated as a lithontriptic, and as often fallen again into disuse. The very contradictory accounts of its effects as a solvent are

now in some degree explicable, since it has been discovered that urinary calculi are very different in their natures, so that some of them are only soluble in acids, and others only in alkalis. Of the last description are the calculi of uric acid, which are very frequent, and those of urate of ammonia. On these, therefore, alkalis may be supposed to make some impression, and that alkalis, or alkaline carbonates, taken by the mouth, have occasionally relieved calculous complaints, is certain. It is, however, said, that their continued use debilitates the stomach; and M. Fourcroy has proposed applying the remedy immediately to the disease, by injecting into the bladder a tepid solution of potass or soda, so dilute that it can be held in the mouth. Before the alkaline solution be injected, the bladder is to be completely evacuated of urine, and washed out with an injection of tepid water. After the alkaline injection has remained in the bladder half an hour or more, it is to be evacuated and allowed to settle. If, on the addition of a little muriatic acid, a precipitate be formed, we shall have reason to conclude that the calculus contains uric acid, and that the alkali has acted on it.

Very dilute alkaline solutions may also be taken into the stomach as antacids, but we possess others which are preferable. The dose is from ten to thirty drops. Externally, alkaline solutions have been more frequently used, either very dilute, simply as a stimulus, in rickets, gouty swellings, gonorrhœa, and spasmodic diseases, or concentrated as a caustic to destroy the poison of the viper and of rabid animals.

Potassa. *Potass.* Strongest Common Caustic.

Take of

Solution of potass, any quantity.

Evaporate it in a covered very clean iron vessel, till, on the ebullition ceasing, the saline matter flows gently like oil, which happens before the vessel becomes red. Then pour it out on a smooth iron plate; let it be divided into small pieces before it hardens, and immediately placed in a well stopped phial.

Potass in this form is used as a caustic. It quickly erodes animal matter, and, mixed with soap, has been used to open an ulcer. But its use as a caustic is incon-

venient, from its being so quickly affected by the air, and from its rapid deliquescence, which renders it apt to spread.

Potassa Cum Calce. *Potass with Lime.* Milder Common Caustic.

Take of

Solution of potass, any quantity.

Evaporate this in a covered iron vessel till one third remain; then mix with it as much new slack lime as will bring it to the consistence of a pretty solid pap, which is to be kept in a vessel closely stopped.

The addition of the lime in this preparation renders it less apt to deliquesce, more easily managed, and milder in its operation than the former.

Carbonas Potassæ. *Carbonate of Potass.* Fixed vegetable Alkaline Salt purified.

Let impure carbonate of potass, put into a crucible, be brought to a low red heat, that the oily impurities, if there be any, may be consumed; then triturate it with an equal weight of water, and mix them thoroughly by agitation. Filtrate the liquor through paper into a very clean iron pot, and boil to dryness, stirring the salt towards the end of the process, to prevent its sticking to the vessel.

The Pearl ashes of commerce are obtained by the incineration of the wood of land vegetables. They contain a considerable proportion of foreign salts, from which they are in a great degree purified by the present process. The salt thus obtained is a subcarbonate of potass, or potass imperfectly saturated with carbonic acid. It is in white grains, is deliquescent, and possesses the alkaline properties. In like manner is purified impure kali from the ashes of any kind of vegetable.

The same salt may be prepared from tartar which must be burnt until it become of an ash colour.

The following easy and cheap method of preparing carbonate of potass, (sal aeratus) by saturating the vegetable alkali with carbonic acid is recommended by that venerable and eminent physician E. A. Holyoke, M. D. of Salem.

Take a cylindrical box of wood about nine or ten inches in diameter, bore eight or ten holes, half an inch in diameter in the side of it, just below the lower edge of the cover, at nearly equal distances all round; bore also as many holes in the circular bottom of the box, close to the edge of it: then take another box of the same kind, but of a smaller diameter by half or three quarters of an inch; place this in the larger, and to keep it steady, thrust three or four wooden wedges between the two boxes. The two boxes being thus prepared, fill the inner one with the purest salt of tartar, or clean, well calcined pearl ashes, or any clean, pure fixed vegetable alkali: put its cover on the outer box, leaving the inner one uncovered; sling this double box thus filled, with a cord, and suspend it in a distiller's vat or cistern, while the wash is fermenting, a little above the liquor, or in an empty cistern, if it has been much used, and still retains the fixed air (carbonic acid); let it remain in this situation for six weeks or two months, or longer if it is not wanted; let it then be taken out, and the salt now fully saturated with the acid, be exposed to the sun and air to dry.

The salt thus prepared, does neither effloresce nor deliquesce in the open air, and for all common purposes is, I believe, equal to that prepared by crystalization.

Note. The pearl ashes had better be put into the box in moderate sized lumps than in powder, that the fixed air may have free access to it.

The salt is much more tolerable to the palate, and may be taken in larger doses than the naked alkali; and as it is decomposed by vegetable acids, as well as the mineral, it may be exhibited instead of the alkali, in perhaps every case where the latter is proper, unless the fixed air is judged improper.

It is much superior to common alkali in forming Riverius' anti-emetic effervescing draught, as it contains a much larger proportion of carbonic acid (in which the principal virtue of that medicine is supposed to reside)

than the mildest fixed alkali, and is at the same time much more palatable.

The doctor commonly directs two drachms or rather more of this salt, to be dissolved in three ounces of fair water; a large spoonful of this solution, added to the same quantity of good vinegar, or lemon juice, at the instant of swallowing it, makes an agreeable dose. But the taste of this solution is so mild, that, if the prescriber choose, a spoonful of it may be swallowed alone at first, and as much vegetable acid immediately upon it, in which case, none of the gas will be lost.

When acidity abounds in the first passages, a little of this salt added to any bitter infusion, or the dry salt added to powder of columbo, or any peptic powder, is an effectual antacid.

In calculous cases, this salt is recommended by writers, particularly by the celebrated Dr. Cullen, in his Materia Medica, as being a happy expedient for conveying larger quantities of alkali into the stomach, than it can bear in its natural state. Hitherto, says the doctor, the common mode of preparing the salt for this purpose, I believe, has been by impregnating a solution of fixed alkali with fixed air, by means of Dr. Nooth's machine; but any one who has prepared the medicine in both ways, will readily give the most decided preference to that above described, on account both of ease and cheapness.

Carbonas Potassæ Purissimus. *Pure Carbonate of Potass.* Salt of Tartar.

Take of

Impure super-tartrite of potass, any quantity.

Burn it to a black mass, by placing it among live coals, either wrapped up in moist bibulous paper, or contained in a crucible. Having reduced this mass to powder, expose it in an open crucible to the action of a moderate fire, till it become white, or at least of an ash gray colour, taking care that it do not melt. Then dissolve it in warm water; strain the liquor through a linen cloth, and evaporate it in a clean iron vessel, diligently stirring it towards the end of the process with an iron spatula, to prevent it from sticking to the bottom of the vessel. A very white salt will remain, which is to be left a little

longer on the fire, till the bottom of the vessel become almost red. Lastly, when the salt is grown cold, keep it in glass vessels well stopped.

By exposing the super-tartrite of potass to heat, the tartarous acid is decomposed. Parts of its carbon and oxygen unite, and form carbonic acid, which is attracted by the potass; and, by continuing the heat, the remaining carbonaceous matter is burnt out. By dissolving the saline matter, the portion of lime, and any other earthy or metallic matter which the super-tartrite may have contained, are separated, and, by evaporation, a salt is obtained, which, like the former, is a sub-carbonate of potass, but more pure.

Carbonate of potass, formerly called *sal tartari*, is frequently employed in medicine, in conjunction with other articles, particularly for the formation of saline neutral draughts and mixtures: but it is used also by itself in doses from three or four grains to fifteen or twenty; and it frequently operates as a powerful diuretic, particularly when aided by proper dilution. [See Carbonas Potassæ impurus in the Materia Medica.]

Aqua Super-carbonatis Potassæ. *Solution of Super-carbonate of Potass.*

Take of

Water, ten pounds,
Pure carbonate of potass, one ounce.

Dissolve and expose the solution to a stream of carbonic acid gas, in the same manner as directed for the water of carbonic acid.

The colder the air is, and the greater pressure, the better is the liquor, which should be kept in well closed vessels. As soon as the preparation is finished, the liquor should be drawn off into pint bottles, which are to be well corked and kept in a cool situation, with the head down, or laid on one side. It should be perfectly transparent, and have an acidulous, not at all alkaline taste; and when poured out of the bottles, it should have a sparkling appearance.

Potass, when used as a lithontriptic, irritates the stomach and bladder so much, that its use cannot be well long continued. But when super-saturated with carbonic

acid, as it is in this preparation, it is much more pleasant and less irritating; and, though its lithontriptic or real solvent power is diminished, or perhaps entirely lost, it is capable of acting as a palliative, and of being continued for any length of time. Indeed, it is the only form in which we can exhibit potass in sufficient doses, and for a sufficent length of time, to derive much benefit from its use in calculous complaints. It has certainly been frequently of advantage in these affections, but probably only in those instances in which the stone consists of uric acid, or urate of ammonia; for although super-saturated with carbonic acid, yet the affinity of that acid for potass is so weak, that it really operates in a degree as an alkali.

Six or eight ounces of this liquor may be taken two or three times a day. It in general proves powerfully diuretic, and sometimes produces inebriation. This last effect is ascribed to the carbonic acid.

Acetis Potassæ. *Acetite of Potass.* Diuretic Salt.

Take of

Pure carbonate of potass, one pound.

Boil it with a very gentle heat, in four or five times its weight of distilled acetous acid; add more acid at different times, till, on the watery part of the preceding quantity being nearly dissipated by evaporation, the new addition of acid cease to raise any effervescence; which will happen, when about twenty pounds of the distilled acetous acid have been consumed. It is then to be slowly dried. The impure salt remaining, is to be melted with a gentle heat, for a short time; and afterwards dissolved in water, and filtered through paper. If the liquefaction have been properly performed, the filtered liquor will be limpid; but if otherwise, of a brown colour. Afterwards evaporate this liquor with a very gentle heat in a very shallow glass vessel, occasionally stirring the salt as it becomes dry, that its moisture may be sooner dissipated. Lastly, the acetite of potass ought to be kept in a vessel very closely stopped, to prevent it from deliquescing.

It is obvious, that, in this process, the acetous acid combines with the potass, disengaging the carbonic acid.

The acetite of potass, obtained by the evaporation, is of a brownish colour, from the presence, either of some

extractive matter contained in the vinegar, or of carbonaceous matter, from a partial decomposition of the acid. It is freed from this by the fusion which is directed; and, by the second solution and evaporation, it is obtained in the form of a white foliated mass, extremely deliquescent.

Acetite of potass, formerly called *sal diureticus*, provided it be properly made, is a medicine of great efficacy, and may be so dosed and managed as to prove either mildly cathartic, or powerfully diuretic: few of the saline deobstruents equal it in virtue. The dose is from half a scruple to a drachm or two. A bare mixture, however, of alkaline salt and vinegar, without exsiccation, is perhaps not inferior as a medicine to the more elaborate salt. Two drachms of the alkali, saturated with vinegar, have been known to occasion, in hydropic cases, ten or twelve stools, and a plentiful discharge of urine, without any inconvenience.

SULPHAS POTASSÆ. *Sulphate of Potass.* Vitriolated Tartar.

Take of

Sulphuric acid diluted, with six times its weight of water, any quantity.

Put it into a capacious glass vessel, and gradually drop into it, of pure carbonate of potass, dissolved in six times its weight of water, as much as is sufficient thoroughly to saturate the acid. The effervescence being finished, strain the liquor through paper; and after due evaporation set it aside to crystalize.

Sulphate of potass may be also conveniently prepared from the residuum of the distillation of nitrous acid, by dissolving it in warm water, and saturating it with carbonate of potass.

In the former of these processes, the sulphuric acid unites with the potass of the carbonate of potass, and expels the carbonic acid with effervescence. In the latter, which is the one generally followed, the excess of sulphuric acid attached to the sulphate of potass, which remains after the distillation of nitrous acid, is saturated by the addition of a sufficient quantity of potass.

Sulphate of potass, formerly *vitriolated tartar*, forms small transparent very hard crystals, generally aggregated in crusts, and permanent in the air. It has a bitter

taste, and is slowly soluble in water. In small doses, as a scruple, or half a drachm, it is a useful aperient; in larger ones, as four or five drachms, a mild cathartic, which does not pass off so hastily as the sulphate of soda, and seems to extend its action further.

Sulphas Potassæ Cum Sulphure. *Sulphate of Potass with Sulphur.* Sal Polychrest.

Take of

Nitrate of potass in powder,
Sublimed sulphur, of each equal parts.

Mix them well together, and inject the mixture, by little and little at a time, into a red hot crucible; the deflagration being over, let the salt cool, after which it is to be put up in a glass vessel well stopped.

The nitrate of potass being decomposed by the red heat, affords oxygen to the sulphur, in such proportions as to convert it into sulphuric and sulphurous acids. Both acids are attracted by the potass. In its medicinal qualities, this saline compound, formerly called *sal polychrestus*, does not appear to differ from the sulphate of potass; and it is soon converted into it by exposure to the air.

Sulphuretum Potassæ. *Sulphuret of Potass.* Liver of Sulphur.

Take of

Carbonate of potass,
Sublimed sulphur, each eight ounces.

Having ground them well together, put them into a large coated crucible; and having fitted a cover to it, and applied live coals cautiously around it, bring them at length to a state of fusion.

Having broken the crucible as soon as it has grown cold, take out the sulphuret, and keep it in a well closed phial.

During the fusion of these two substances, the sulphur and potass combine, and the carbonic acid is disengaged. The compound is easily fusible, and is of a brown colour, and inodorous. It is immediately partially decomposed

by water, and portions of sulphate of potass and sulphurated hydrogen formed.

This preparation, formerly called *hepar sulphuris* (liver of sulphur), has been proposed to be used as an antidote to some of the metallic poisons, from the supposition that the sulphur would combine with the metallic preparation, and render it inert. From a similar theory it has been imagined that it might obviate the effects of mercury on the system when these are too violent; but is very seldom had recourse to with either intention. The dose in which it has been proposed to be given, is from ten to twenty grains, three or four times a day. It is said in some cases of cancer, to have increased the efficacy of cicuta as a palliative, in doses of five grains.

TARTRIS POTASSÆ. *Tartrite of Potass.* Soluble Tartar.

Take of

Carbonate of potass, one pound,
Super-tartrite of potass, three pounds, or as much as may be sufficient,
Boiling water, fifteen pounds.

To the carbonate of potass dissolved in the water, gradually add the super-tartrite of potass in fine powder, as long as it raises any effervescence, which generally ceases before three times the weight of the carbonate of potass has been added; then strain the cooled liquor through paper, and, after due evaporation, set it aside to crystalize.

The excess of tartarous acid in the super-tartrite of potass, is saturated by the potass of the carbonate of potass, and the proper neutral salt formed. It is not easily crystalized. In its preparation, therefore, the solution is usually evaporated to dryness. It has an unpleasant bitter taste. It is soluble in four parts of cold water, and still more soluble in boiling water; and it is also soluble in alcohol.

This neutral salt, formerly called *soluble tartar*, is totally or partially decomposed by all acids. On this account it is improper to join it with tamarinds, or such like acid fruits, which is too often done in the extemporaneous practice of those physicians who are fond of mixing different cathartics together, and know little of chemistry.

In doses of a scruple, half a drachm, or a drachm, this salt is a mild cooling aperient; two or three drachms

commonly loosen the belly; and an ounce proves pretty strongly purgative. It has been particularly recommended as a purgative for maniacal and melancholic patients. It is an useful addition to the purgatives of the resinous kind, as it promotes their operation, and at the same time tends to correct their griping quality.

Carbonas Sodæ. *Carbonate of Soda.* Purified fixed fossil Alkaline Salt.

Take of

Impure carbonate of soda, any quantity.

Bruise it; then boil in water till all the salt be dissolved. Strain the solution through paper, and evaporate it in an iron vessel, so that after it has cooled, the salt may crystalize.

Impure carbonate of soda, the Barilla of commerce, is obtained from the incineration of certain marine plants. It consists of carbonate of soda, with charcoal, oxide of iron, and various other impurities. From these it is in a great measure freed by solution and crystalization. It was formerly called *purified fixed fossil alkaline salt*, and has been used principally as a lithontriptic, under the form of the watery solution super-saturated with carbonic acid, or made into pills with soap; of which half a drachm or a drachm, are taken in the course of the day.

Mr. William Dunn of Boston has announced his intention of manufacturing carbonate of soda to any amount which may be required.

Aqua Super-Carbonatis Sodæ. *Solution of Super-Carbonate of Soda.*

Take of

Water, ten pounds.
Carbonate of soda, two ounces.

Dissolve and expose the solution to a stream of carbonic acid gas, in the same manner as directed for the water of carbonic acid.

It is used as a lithontriptic, in the same dose as the water of super-carbonate of potass, and has generally been prefered to it, on the supposition of being more pleasant.

Phosphas Sodæ. *Phosphate of Soda.*

Take of

Bones burnt to whiteness, and powdered, ten pounds,
Sulphuric acid, six pounds,
Water, nine pounds.

Mix the powder with the sulphuric acid in an earthern vessel; then add the water and mix again. Then place the vessel in a vapour bath, and digest for three days; after which dilute the mass with nine pounds more of boiling water, and strain the liquor through a strong linen cloth, pouring over it boiling water, in small quantities at a time, until the whole acid be washed out.

Set by the strained liquor, that the impurities may subside, decant the clear solution, and evaporate it to nine pounds. To this liquor, poured from the impurities, and heated in an earthern vessel, add carbonate of soda, dissolved in warm water, until the effervescence cease. Filter the neutralized liquor, and set it aside to crystalize. To the liquor that remains, after the crystals are taken out, add a little carbonate of soda, if necessary, so as to saturate exactly the phosphoric acid, and dispose the liquor by evaporation to form crystals as long as these can be produced. Lastly, the crystals are to be kept in a well closed vessel.

The white residuum of burnt bones consists chiefly of phosphate of lime. The sulphuric acid decomposes it, by combining with the lime; the phosphoric acid, which is disengaged, dissolves, however, a portion of undecomposed phosphate of lime, forming a soluble compound. When carbonate of soda is added to the acidulous liquor, obtained by washing the materials, the soda combines with the free phosphoric acid; the neutral phosphate of lime, which was combined with that acid, is precipitated, and the phosphate of soda crystalizes on evaporation of the strained liquor. Its crystals are rhomboidal, efflorescent, and require for solution only four parts of cold water. They consist, according to Thenard, of nineteen of soda, fifteen of acid, and sixty-six of water. Its taste is purely saline, without any bitterness.

Phosphate of soda was introduced into the practice of physic by the ingenious Dr. Pearson, of London. It pos-

sesses the same medical qualities as the sulphate of soda, and the tartrite of potass and soda, being an excellent purge in the quantity of an ounce or ten drachms; and has the peculiar advantage over these two salts in being much less nauseous than they are. Its taste is extremely similar to that of common salt; and when given in a bason of water gruel, or veal broth without salt, it is scarcely perceptible by the palate, and consequently is well adapted for patients whose stomachs are delicate, and who have an antipathy against the other salts.

SULPHAS SODÆ. *Sulphate of Soda.* Glauber's Salt.

Dissolve the acidulous salt which remains after the distillation of muriatic acid, in water; and having mixed chalk with it to remove the superfluous acid, set it aside until the sediment subside; then decant the liquor, strain it through paper, and evaporate it so that it may crystalize.

In the decomposition of muriate of soda by sulphuric acid, to prepare muriatic acid, more sulphuric acid is used than is barely sufficient; and hence the necessity of saturating this excess by the addition of chalk or carbonate of lime. The neutral sulphate of soda crystalizes in hexhædral prisms; they are efflorescent and soluble in rather less than three parts of cold water. Their taste is at first salt, and afterwards disagreeably bitter. They consist, when dried, of fifty-six parts of sulphuric acid, and forty-four of soda.

Taken from half an ounce to an ounce, or more, it proves a mild and useful purgative; and in smaller doses largely diluted, a serviceable aperient and diuretic. It is commonly given in solution; but it may also be given in powder, after it has effloresced. In this form the dose must be reduced to one half.

The very disagreeable taste of cathartic salts may be in a great measure destroyed by dissolving them in hot lemonade, or by adding to the solution a little of the vegetable acid.

At the salt works in the county of Barnstable, Glauber's salt is prepared to great advantage from the bittern that remains after the crystalization of common salt. This bitter liquor is preserved in the vats; and during the cold in winter the salt is found collected in fine crystal-

at the bottom. This is purified by moderately boiling in fresh water, and the salt is again crystalized in large shallow vessels. The sulphate of soda prepared at these works is equal in quality to any that is imported, and may be made abundant enough for the whole home market, and the West India Islands. It has been sold at the low price of three dollars per hundred weight; and has been exported to the East and West Indies, where it has come to a profitable market.

Like European salts, it is apt to effloresce, but if secluded from the air and light, for twelve or eighteen months, it becomes hard and permanent.

Tartris Potassæ et Sodæ. *Tartrite of Potass and Soda.* Rochelle Salt.

It is prepared from the carbonate of soda and supertartrite of potass, in the same manner as the tartrite of potass.

The excess of tartarous acid in the acidulous tartrite of potass, being saturated in this preparation with soda, a triple salt is formed. It crystalizes in rhomboidal prisms. Under the name of *Rochelle salt*, it has been employed as a cathartic, in a dose of one ounce; and is often prefered, as being less disagreeable than the greater number of the saline catharties. It consists of fifty-four parts of tartrite of potass, and forty-six of tartrite of soda.

Aqua Ammoniæ. *Water of Ammonia.* Water of Caustic Ammonia.

Take of

Muriate of ammonia, one pound,
Lime, fresh burnt, one pound and an half,
Distilled water, one pound,
Water, nine ounces.

Pour the water on the powdered lime contained in an iron or earthen vessel, which is then to be covered up till the lime fall to powder. Then mix the muriate previously ground into very fine powder, thoroughly with the lime, by triturating them together in a mortar, and immediately put the mixture into a retort of bottle glass. Put the retort in a sand bath, and connect with it a

Woulfe's apparatus. In the first and smallest bottle, furnished with a tube of safety, put two ounces of the distilled water, and in the second the rest of the distilled water.

The fire is now to be kindled, and gradually increased, until the bottom of the sand pot become red. Mix the fluid contained in each of the bottles, and preserve it in small phials accurately closed.

The theory of this process is precisely the same with that directed for the preparation of the lixivium causticum. The lime attracts the muriatic acid of the muriate of ammonia, and the ammonia, or volatile salt, is disengaged, and arises in a liquid form. By itself it is incondensable, but it combines with the watery vapour, and forms an aqeous solution. To conduct the process to advantage, a series of receivers is necessary, in which water is disposed, to absorb entirely, the ammoniacal gas.

When water is perfectly saturated with ammonia, one hundred grains are found to combine with thirty-four; but, in the usual mode of preparing this solution, this perfect saturation is never effected. The solution has a strong pungent smell, a very acrimonious taste, and inflames the skin. It is used in medicine as a powerful stimulant and diaphoretic internally, in a dose of twenty drops largely diluted. Externally, it is applied to the skin as a rubefacient, and in the form of gas to the nostrils, and to the eyes as a stimulant, in cases of torpor, paralysis, rheumatism, syncope, hysteria, and chronic ophthalmia.

Alcohol Ammoniatum. *Ammoniated Alcohol;* or Spirit of Ammonia.

Take of

Alcohol, thirty-two ounces,
Lime, fresh burnt, twelve ounces,
Muriate of ammonia, eight ounces,
Water, eight ounces.

From these ingredients, ammoniated alcohol is prepared, in exactly the same manner, as the water of ammonia.

Though in this process carbonate of ammonia be the principal product, from the decomposition of the muriate of ammonia, by the carbonate of potass, yet, from the potass not being fully saturated with carbonic acid, a

quantity of pure ammonia is disengaged, and combines with the alcohol. A part of the water also of the diluted alcohol distilling over, dissolves a portion of the carbonate of ammonia.

The compound has the pungent ammoniacal smell. It is used principally as the menstruum of some vegetables, with which ammonia coincides in medicinal operations.

CARBONAS AMMONIÆ. *Carbonate of Ammonia.* Prepared Ammonia.

Take of

Muriate of ammonia, one pound,
Pure soft carbonate of lime dried, two pounds.

Having triturated them separately, mix them thoroughly, and sublime from a retort into a refrigerated receiver.

This process is an example of double elective attraction. The muriatic acid of the muriate of ammonia combines with the lime of the carbonate of lime, and the carbonic acid of the latter unites with the ammonia of the former. The carbonate of ammonia which is formed, is sublimed, and is obtained in a white crystaline cake. When the process is carried on in the large way, the sublimation is generally performed from an iron pot, to which the heat is directly applied.

Carbonate of ammonia has the smell and taste of ammonia, but weaker. It is soluble in twice its weight of cold water, and is more soluble as the temperature of the water increases; but when it approaches to a boiling heat, the carbonate is volatilized. It is efflorescent when exposed to the air; and is decomposed by most of the acids.

The volatile alkali and spirit obtained from sal ammoniac are the purest of all the medicines of this kind. They are somewhat more acrimonious than those produced directly from animal substances, which always contain a portion of the oil of the subject, and receive from thence some degree of saponaceous quality.

The volatile salt and spirit prepared from hartshorn and animal bones, are now entirely superseded by those obtained from sal ammoniac, and the process for preparing them is rejected by the Edinburgh college.

Volatile alkaline salts, and their solutions called spirits, agree in many respects, with fixt alkalis and their solutions or leys: as in changing the colours of a blue flower to a green: effervescing, when in their mild state, with, and neutralizing acids; and corroding the fleshy parts so as to act as caustics. By their stimulating smell, they prove serviceable in languors and faintings. Taken internally, they stimulate, greatly promote perspiration, and act particularly on the nervous system. They prove useful in lethargic cases; in hysterical and hypochondriacal disorders, and in the langnors, headachs, flatulent colics, and other symptoms which attend them. In some fevers, particularly those of a low kind, in aged persons, and those of phlegmatic habits, and accompanied with a cough, hoarseness, &c. they are of great utility, raising the vis vitæ, and exciting a salutary diaphoresis. The dose of the salt is from five to fifteen grains, and of the spirit thirty or forty drops in cold water.

The use of the volatile ammonia has lately been attended with uncommon success in cases of the bite of venemous serpents. Mr. John Williams speaks in the most positive manner of the good effects of the volatile alkali, (spirits of hartshorn or spirit of sal ammoniac) in curing the effects of the bite of venemous snakes in the East Indies. Dr. Wright, who practised many years in Jamaica, directs forty drops of the caustic volatile alkali, as soon as possible after the accident; the dose being repeated every five minutes, while the parts affected are continually washed with the same preparation. A remarkable instance is reported to have occurred at Savannah, in which was experienced the most decided benefit from the use of alkalis in a negro who was bitten by a venemous snake in the foot. The patient was ordered one or two tea spoonfuls of an alkaline solution every fifteen minutes, and the part affected to be kept moist with the solution. The first dose produced immediate good effects, in mitigating the excessive pain and swelling which were making rapid progress up the limb to the body; and a proper repetition of the remedy soon effected a complete cure. The efficacy of this remedy in similar alarming cases, has lately been confirmed, by a publication of Dr. Ramsey, of South Carolina.

Ammonia is well known to possess a like antiseptic quality with other alkaline salts, and is employed for similar purposes.

Aqua Carbonatis Ammoniæ. *Solution of Carbonate of Ammonia.* Water of Ammonia.

Take of

Muriate of ammonia,
Carbonate of potass, each sixteen ounces,
Water, two pounds.

Having mixed the salts and put them into a glass retort, pour the water upon them, and distill to dryness in a sand bath, gradually increasing the heat.

In this preparation of carbonate of ammonia by the humid way, carbonate of lime (chalk) could not be employed to decompose the muriate of ammonia; because the addition of the water prevents the application of the necessary heat, whereas carbonate of potass acts at a moderate temperature. The potass attracts the muriatic acid, the ammonia the carbonic acid. The carbonate of ammonia is volatilized, and dissolved by the watery vapour. The solution is applied to the same medicinal purposes as the concrete ammoniacal carbonate.

A formula is given by the London College for a similar preparation, under the name of liquor carbonatis ammoniæ, obtained by the solution of the solid carbonate in water. Eight ounces of the carbonate of ammonia are dissolved in a pint of distilled water, and the solution is strained through paper.

Aqua Acetitis Ammoniæ. *Water of Acetite of Ammonia.* Spirit of Mindererus.

Take of

Carbonate of ammonia in powder any quantity.

Pour upon it as much distilled acetous acid as may be sufficient to saturate the ammonia exactly.

In this preparation, the acetous acid combines with the ammonia, and the carbonic acid is disengaged with effervescence. The acetite of ammonia remains dissolved in the water of the acetous acid. As the strength of distilled vinegar is not always the same, that of this solution must be variable; an inconvenience not easily obviated.

The following cheap and expeditious method of saturating the common solution obtained by dissolving sal

ammoniac (carbonate of ammonia) in vinegar, with fixed air, or *carbonic acid gas*, is too valuable to be omitted.*

Take an ounce of pure sal ammoniac (carbonate of ammonia) and one pint and a half of distilled vinegar; put the latter in a decanter, provided with a close glass stopper; then introduce the salt, previously broken into lumps, but not too small, as by plunging it too suddenly into the liquor, the extrication of the gas would be too quick, and a quantity of it dissipated. Next, the stopper of the bottle should be tied over with a bit of leather, and the whole be left undisturbed. It would be further useful, to add on the top of the bottle some weight or pressure, by which means the combination of the carbonic acid gas with the water will be greatly facilitated. After having stood a few hours, the ammonia will be dissolved, and the carbonic acid gas will be absorbed by the liquor. By this simple process, the water of acetite of ammonia becomes strongly impregnated with fixed air, while it is almost entirely deprived of that disagreeable taste, which is peculiar to this medicine, when prepared in the usual way.

Dr. Lynam, an English practitioner, speaks from experience of the superior qualities this preparation possesses as a febrifuge; besides the very great advantage, that it tends to keep the bowels open, even under the immediate influence of opiates. It likewise generally agrees with weak and irritable stomachs, which can retain scarcely any other medicine.

Acetite of ammonia, when assisted by a warm regimen, proves an excellent and powerful sudorific; and as it operates without quickening the circulation or increasing the heat of the body, it is admissible in febrile and inflammatory diseases, in which the use of stimulating sudorifics is attended with danger. Its action may likewise be determined to the kidneys by walking about in a cool air. The common dose is half an ounce, either by itself, or along with other medicines adapted to the same intention.

Pure vinegar is sometimes employed instead of the distilled acetous acid in this preparation.

* Vide Rees' Cycloped. Article Ammonia.

HYDRO-SULPHURETUM AMMONIÆ. *Hydro Sulphuret of Ammonia.*

Take of

Water of ammonia, four ounces, subject it in a chemical aparatus to a stream of the gas, which arises from
Sulphuret of iron, four ounces,
Muriatic acid, eight ounces, previously diluted with two pounds and a half of water.

Sulphuret of iron is conveniently prepared for this purpose, from

Purified filings of iron, three parts.
Sublimed sulphur, one part.

Mixed and exposed to a moderate degree of heat in a covered crucible, until they unite into a mass.

The sulphureted hydrogen is produced in this process by the muriatic acid disposing the iron to decompose part of the water. The hydrogen disengaged, immediately combines with a portion of the sulphur present, and this compound escaping in the state of gas, is passed through the water of ammonia, with which it unites, and forms a liquor of a dark green colour, and very fœtid odour.

Hydro sulphuret of ammonia acts powerfully on the living system. It induces vertigo, drowsiness, nausea, and vomiting, and lessens the action of the heart and arteries. It therefore seems to be a direct sedative. The principal application of it is in diabetes, with the view of reducing the morbid appetite and increased action of the stomach. It is given in a dose of from five to fifteen drops twice a day.

MURIAS BARYTÆ. *Muriate of Barytes.*

Take of

Carbonate of barytes,
Muriatic acid, each one part,
Water, three parts.

Add the carbonate, broken into little bits, to the water and acid, previously mixed. After the effervescence has ceased, digest for an hour, strain the liquor, and set it aside to crystalize. Repeat the evaporation as long as any crystals are formed.

If the carbonate of barytes cannot be procured, the muriate may be prepared in the following manner from the sulphate.

Take of

Sulphate of barytes, two pounds,
Charcoal of wood in powder, four ounces.

Roast the sulphate with fire, that it may be more easily reduced to a very fine powder, with which the charcoal is to be intimately mixed. Put the mixture into a crucible, and having fitted it with a cover, heat it with a strong fire for six hours. Then triturate the matter well, and throw it into six pounds of water, in an earthen or glass vessel, and mix them by agitation, preventing as much as possible the access of the air.

Let the vessel stand in a vapour bath until the part not dissolved shall subside, then pour off the liquor; on the undissolved part pour four pounds more of boiling water, which, after agitation and deposition, are to be added to the former liquor. Into the liquor while still warm, or if it shall have cooled, again heated, drop muriatic acid as long as it excites any effervescence. Then strain it and evaporate it so as to crystalize.

Sulphate of barytes may be decomposed by carbonate of potass by double affinity, and perhaps this is the least troublesome process; but, when done with the view to the medicinal application of the barytes, it has been supposed defective, as it does not separate the metallic substances with which the native sulphate is so frequently intermixed. The process of decomposing it, therefore, by charcoal, has been deemed preferable. The carbonaceous matter attracts the oxygen of the sulphuric acid; the sulphur remains united with the barytes. This sulphuret of barytes, as well as a portion of hydro-sulphuret formed during the solution, are soluble in water; on dropping in muriatic acid, it combines with the barytes, the sulphur is precipitated, and the sulphurated hydrogen disengaged. By straining and evaporating the liquor, the muriate of barytes is obtained crystalized. It is used under the form of solution, for which also the following formula is given.

Solutio Muriatis Barytæ. *Solution of Muriate of Barytes.*

Take of

Muriate of barytes, one part,
Distilled water, three parts,

Dissolve.

The saturated solution of muriate of barytes was introduced by Dr. Crawford, as a remedy in scrofula, and it has since been used in various forms of hectic fever. Its effects are to improve the appetite and general strength; sometimes it occasions diaphoresis or diuresis. Its dose is five drops, gradually increased to twenty or more. In too large a dose it occasions sickness, vertigo, tremors, and insensibility. The solution is also used externally as a stimulating and gentle escharotic application in cutaneous diseases, fungous ulcers, and specks upon the cornea

Aqua Calcis. *Lime Water.*

Take of

Lime recently burnt, half a pound.

Put it into an earthen vessel, and sprinkle on it four ounces of water, keeping the vessel shut, while the lime grows hot, and falls into powder. Then pour on it twelve pounds of water, and mix the lime thoroughly with the water, by agitation. After the lime has subsided, repeat the agitation; and let this be done about ten times, always keeping the vessel shut, that the free access of the air may be prevented. Lastly, let the water be filtered through paper, placed in a funnel, with glass rods interposed between them, that the water may pass as quickly as possible.

It must be kept in very close bottles.

The caution to exclude the air in this process, arises from the supposition that the lime would combine rapidly with the carbonic acid of the atmosphere. After the solution is strained, it is at least necessary, that it should be kept in vessels well stopped. Lime is not more soluble in hot water, than in cold; therefore it is unnecessary to use boiling water. Only a very small quantity of lime is dissolved; about two grains to the ounce.

Lime water is transparent and colourless. It has an austere, acrid taste, and affects vegetable colours as the alkalis do. When applied to the living fibre, lime water corrugates, and shortens it; it therefore possesses astringent powers. It is also a powerful antacid; or, at least, it combines with, and neutralizes acids when it comes in contact with them. It also dissolves mucus, and kills internal worms. From possessing these properties, it is used in medicine, in diseases supposed to arise from laxity or debility of the solids, as diarrhœa, diabetes, leucorrhœa, scrofula, and scurvy; in affections of the stomach, accompanied with acidity and flatulence, when the intestines are loaded with mucus; and in worms. Lime water is scarcely capable of dissolving, even out of the body, any of the substances of which urinary calculi consist; it has therefore no pretensions to the character of a lithontriptic. It has been also recommended in crusta lactea, cancer, and chronic cutaneous diseases. Externally it is applied to ill-conditioned ulcers, gangrenous sores, as a wash in tinea capitis and psora; and as an injection in gonorrhœa, fistulas, and ulcers of the bladder. When taken internally, its taste is said to be best covered by luke warm milk. Its dose is commonly from two to four ounces, frequently repeated; but when long continued, it weakens the organs of digestion.

Lime water is an excellent remedy for a broken winded horse.

Carbonas Calcis Præparatus. *Prepared Carbonate of Lime.*

Carbonate of lime, whether the variety, commonly called chalk, or that called crab's eyes and crab's stones, after having been triturated to powder in an iron mortar, and levigated on a porphyry stone, with a little water, is to be put into a large vessel, and water to be poured upon it; which, after agitating the vessel repeatedly, is to be again poured off, while loaded with fine powder. On allowing the water to settle, a subtile powder will subside, which is to be dried.

The coarse powder which the water could not suspend, may be levigated again, and treated in the same manner.

Carbonate of lime, formerly prepared chalk, is commonly called an absorbent earth. It certainly is an

antacid, that is, it combines with and neutralizes most acids, while its carbonic acid is expelled in the form of gas. It is therefore exhibited in affections of the stomach, accompanied with acidity, especially when at the same time there is a tendency to diarrhœa. The fear of its forming concretions in the bowels, is probably imaginary; for it is not warranted either by theory or experience.

Applied externally, carbonate of lime may be considered as an absorbent in another point of view; for its beneficial action on burns and ulcers, probably arises entirely from its imbibing the moisture or ichorus matter, as a sponge would do, and thus preventing it from acting on the abraded surfaces, and excoriating the neighbouring parts.

Red coral, (corallium rubrum) is ordered to be prepared in the same manner, in the London Pharmacopœia; but, as it has no qualities but those of carbonate of lime, there is no necessity for retaining it in the lists of the Materia Medica.

Solutio Muriatis Calcis. *Solution of Muriate of Lime.*

Take of

Hard carbonate of lime, that is, white marble, broken into pieces, nine ounces,
Muriatic acid, sixteen ounces,
Water, eight ounces.

Mix the acid with the water, and gradually add the pieces of carbonate of lime. When the effervescence has ceased, digest them for an hour; pour off the liquor and evaporate it to dryness. Dissolve the residuum in its weight and a half of water; and, lastly, filter the solution.

The muriatic acid obviously combines with the lime, and disengages the carbonic acid. Its taste is pungent, bitter and disagreeable. It is one of the most deliquescent salts that we know, and is soluble in water; that fluid seems capable of dissolving twice its weight, or at least forms with it a viscid liquid.

It was first proposed as a medicine by Fourcroy, in scrofulous and glandular diseases, and has been lately extravagantly extolled by Dr. Beddoes, in the same affec-

tions. A drachm, diluted with an ounce of water, he considers as a medium dose. In an over dose, it has produced qualms and sickness; and three drachms and an half, killed a dog, whose stomach, upon dissection, had its villous coat blood-shot, and in many parts almost thick, and converted into a gelatinous slime.

The solution of muriate of lime, has been strongly recommended as a tonic, similar and not inferior to the muriate of barytes.

Phosphas Calcis Impurus. *Impure Phosphate of Lime.*

Burn pieces of hartshorn till they become perfectly white; then reduce them to a very fine powder.

In the burning of hartshorn, a strong fire, and the free admission of air are necessary. The potter's furnace was formerly directed for the sake of convenience, but any common furnace or stove will do. If the pieces of horn be laid on some lighted charcoal, spread on the bottom of the grate, they will be burnt to a whiteness, still retaining their original form.

Burnt hartshorn, from its white earthy appearance, was formerly considered as an absorbent earth. But since it has been accurately analyzed, that idea has been given up, and its use has been suggested as a remedy in the rickets, a disease, in which the deficiency of the natural deposition of phosphate of lime in the bones, seems to be the essential, or at least, most striking symptom. Mr. Bonhomme, therefore, gave it to the extent of half a scruple, mixed with phosphate of soda, in several cases, with apparent success. Whatever objections may be made to his theory, the practice certainly deserves a trial.

Carbonas Magnesiæ. *Carbonate of Magnesia.* Magnesia Alba.

Take of

Sulphate of magnesia,
Corbonate of potass, equal weights.

Dissolve them separately in double their quantity of warm water, and let the liquors be strained or otherwise freed from the feces; then mix them and instantly add eight times their quantity of warm water. Let the liquor

boil for a little on the fire, stirring it at the same time; then let it rest till the heat be somewhat diminished; after which strain it through linen; the carbonate of magnesia will remain upon the cloth, and it is to be washed with pure water till it become altogether void of saline taste.

In this process there is a mutual decomposition of the two salts employed. The potass unites itself to the sulphuric acid, while the carbonic acid combines with the magnesia.

The large quantity of water used, is necessary for the solution of the sulphate of potass formed; and the boiling is indispensably necessary for the expulsion of a portion of the carbonic acid, which retains a part of the magnesia in solution.

Sulphate of potass may be obtained from the liquor which passes through the filter, by evaporation. This is not pure, however, but mixed with undecomposed carbonate of potass: for one hundred parts of crystalized carbonate of potass, are sufficient for the decomposition of one hundred and twenty-five parts of sulphate of magnesia; and as the carbonate of potass of commerce contains a larger proportion of alkali than the crystalized carbonate, a still less proportion should be used. From these quantities, about forty-five parts of carbonate of magnesia are obtained. Boiling the liquor gives the carbonate of magnesia a smoothness, which it has not when this precaution is not observed.

The ablutions should be made with pure water; for nicer purposes, distilled water may be used; and soft water is in every case necessary. Hard water for this process, is peculiarly inadmissible, as the principle of water's giving the property called *hardness*, is generally owing to a salt of lime, which decomposes the carbonate of magnesia by compound affinity, giving rise to carbonate of lime, while the magnesia unites itself to the acid of the calcareous salt, by which the quantity of the carbonate is not only lessened, but is rendered impure by the admixture of the carbonate of lime. Another source of impurity, is the silica which the sub-carbonate of potass generally contains. It is most easily got rid of, by exposing the alkaline solution to the air for several days, before it is used. In proportion as it becomes saturated with the carbonic acid, the silica is precipitated and may be separated by filtration.

Carbonate of magnesia, however, is generally prepared on a large scale from the bittern, or liquor remaining after the crystalization of the muriate of soda, from sea water, which is principally a solution of muriate of magnesia: and there are some niceties of manipulation requisite to give it the lightness and smoothness, which are marks of its goodness.

The carbonate of magnesia is a very light, white, opaque substance, without smell or taste, effervescing with acids. It is not, however, saturated with carbonic acid. By decomposing sulphate of magnesia by an alkaline carbonate, without the application of heat, carbonate of magnesia is gradually deposited in transparent, brilliant crystals, and soluble in about four hundred and eighty times its weight of water. The crystalized carbonate of magnesia consists of fifty acid, twenty-five magnesia, and twenty-five water; the sub-carbonate consists of forty-eight acid, forty magnesia, and twelve water; and the carbonate of commerce of thirty-four acid, forty-five magnesia, and twenty-one water.

Carbonate of magnesia is principally given to correct acidity of the stomach, and in these cases to act as a purgative; for solutions of magnesia in all acids are bitter and purgative; whilst those of the other earths, are more or less austere and astringent. A large dose of magnesia, if the stomach contain no acid to dissolve it, neither purges, nor produces any sensible effect; a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures several stools; whereas, the common absorbents, under the same circumstances, instead of loosening, bind the belly.

When the carbonate of magnesia meets with an acid in the stomach, there is extricated a considerable quantity of carbonic acid gas, which sometimes causes uneasy distention of the stomach, and the symptoms of flatulence. In such cases, therefore, magnesia is preferable to its carbonate; but on other occasions, good effects arise from the action of the gas evolved, as in nausea and vomiting. It is given as an antacid, in a dose of from a scruple to a drachm.

Some attempts have been made by the manufacturers of common salt, at Cape Cod, to prepare carbonate of magnesia from the bittern, which is well known to hold a quantity of the muriate of magnesia in solution, and could the artists acquire the necessary practical skill,

this article might be procured at those works in a state of purity, and to an extent adequate to every demand.

It affords great satisfaction to announce that the manufacture of this article on an extensive scale has been commenced in this state by Mr. William Dunn, apothecary and chemist of Boston. His apparatus is connected with an extensive salt-work. He calculates to make thirty thousand pounds a year, sufficient to supply the United States and any other demand which may be made. From each gallon of bittern about five or six ounces of magnesia is obtained. When first formed it is very pure, but by exposure to the air it attracts carbonic acid, and has then all the appearance of the carbonate of magnesia of the shops. Some specimens of it have been examined, and pronounced equally as pure as that imported. Connected with the apparatus, kettles are prepared for burning the carbonate to form the pure magnesian earth.

MAGNESIA. *Magnesia.* Calcined Magnesia.

Let carbonate of magnesia, put into a crucible, be kept in a red heat for two hours; then put it up in close stopped glass vessels.

By this process the carbonate of magnesia is freed from its acid and water; and, according to the late Dr. Black's experiment, loses about seven twelfths of its weight. A kind of opaque, foggy vapour is observed to escape during the calcination, which is nothing else than a quantity of fine particles of magnesia, buoyed off with a stream of the disengaged gas. About the end of the operation, the magnesia exhibits a kind of luminous, or phosphorescent property, which may be considered as a pretty exact criterion of its being deprived of its acid.

It is to be kept in close vessels, because it attracts, though slowly, the carbonic acid of the atmosphere.

In medicine, it is used for the same general purposes as the carbonate. In certain affections of the stomach, accompanied with much flatulence, magnesia is preferable, both because it contains more magnesia in a given bulk, and, being deprived of its acid, it neutralizes the acid of the stomach, without any extrication of gas, which is often a troublesome consequence when carbonate of magnesia is employed in these complaints.

Super-Sulphas Aluminæ et Potassæ Exsiccatus.

Dried Super-Sulphate of Alumina and Potass. Burnt Alum.

Melt super-sulphate of alumina and potass in an earthen or iron vessel, and keep it over the fire until it cease to boil. By this process the alum loses its water of crystalization, and becomes more active as an escharotic, for which purpose this preparation is used. Unless for external use as a dry powder, the virtues of alum are not improved by exposure to fire. When burnt it is a mild caustic, and is a principal ingredient in most styptic powders; and as a gentle escharotic it is applied to fungus ulcers.

CHAPTER III.

METALLINE PREPARATIONS.

The following metals are employed in medical practice: Silver, Quicksilver, Copper, Iron, Tin, Lead, Zinc, Antimony, Arsenic, and Bismuth.

It has already been observed, that metals, in their pure state, do not appear to exert any action on the living system; their combinations only possess medicinal virtues.

The oxidation of metals, and the combination of their oxides with acids, are the chemical changes which communicate to them activity. In general they are more active, in proportion as they are more highly oxidated, and are still more so when combined with acids. Oxigen is not, however, to be regarded, according to a modern hypothesis, as the source of their activity: each metal possesses powers, which, though increased or diminished according to the degree of oxidation, are peculiar to itself, and remain in all its preparations.

ANTIMONY.

Sulphuretum Antimonii Præparatum. *Prepared Sulphuret of Antimony.*

Sulphuret of antimony is prepared in the same manner as carbonate of lime. [See page 414.]

Oxidum Antimonii Cum sulphure, Per Nitratem Potassæ. *Oxide of antimony, with Sulphur, by Nitrate of Potass.* Crocus of Antimony.

Take of

Sulphuret of antimony,
Nitrate of potass, equal weights.

After they are separately powdered and well mixed, let them be injected into a red hot crucible; when the deflagration is over, separate the reddish metallic matter from the whitish crust; powder it, and edulcorate it by

repeated washings with hot water, till the water come off insipid.

During the deflagration, the nitric acid of the nitrate of potass is decomposed; its oxigen is attracted, partly by the sulphur, and partly by the antimony. The sulphurous acid which is the principal product of the oxigenation of the sulphur, is in part dissipated, and in part combined with the potass, and forms the white crust which is directed to be removed. By the union of another portion of the oxygen with the antimony, a brown or reddish oxide is formed. It appears also, that part of the sulphuret of antimony escapes decomposition or oxygenation, and unites with the oxide. The preparation, therefore, is an imperfect oxide of antimony.

As an antimonial, this preparation is so uncertain in its operation, that it is never prescribed; it is used in making some of the other preparations of this metal.

Oxidum Antimonii, Cum Sulphure, Vitrificatum.

Vitrified Oxide of Antimony with Sulphur. Glass of Antimony.

Strew sulphuret of antimony beat into a coarse powder like sand, upon a shallow unglazed earthen vessel, and apply a gentle fire underneath, that the sulphuret may be heated slowly; keeping it at the same time continually stirring, to prevent it from running into lumps. White vapours of sulphurous smell will arise from it. When they cease with the degree of heat first applied, increase the fire a little, so that the vapours may again arise; go on in the same manner, till the powder, when brought to a red heat, exhale no more vapours. Melt this powder in a crucible with an intense heat, till it assume the appearance of melted glass; then pour it out on a heated brass plate.

In the first stage of this process the greatest part of the sulphur of the sulphuret of antimony is dissipated, and the antimony is imperfectly oxidated. This oxide is then vitrified by the more extensive heat applied. According to Thenard, it contains sixteen of oxygen to the one hundred.

This preparation is violent, and at the same time uncertain in its operation; and is not used, but in preparing some of the other antimonials.

OXIDUM ANTIMONII VITRIFICATUM, CUM CERA. *Vitrified Oxide of Antimony with wax.* Cerated glass of Antimony.

Take of

Yellow wax, one part,
Vitrified oxide of antimony with sulphur, eight parts.

Melt the wax in an iron vessel, and throw into it the powdered oxide; roast the mixture over a gentle fire for a quarter of an hour, continually stirring it; then pour it out, and when cold, grind it into powder.

The glass melts in the wax with a very gentle heat. After it has been about twenty minutes on the fire, it begins to change its colour, and in ten more, comes near to that of Scottish snuff, which is a mark of its being sufficiently prepared; the mixture loses about one ninth of its weight in the process.

The cerated glass of antimony was for some time much esteemed in dysenteries. The dose is from two or three grains, to twelve, or more, according to the age and strength of the patient. In its operation, it is both emetic and cathartic; though it has sometimes effected a cure without occasioning any evacuation or sickness. It is now, however, much less used than formerly.

SULPHURETUM ANTIMONII PRÆCIPITATUM. *Precipitated Sulphuret of Antimony.* Golden Sulphur of Antimony.

Take of

Solution of potass, four pounds,
Water, three pounds,
Prepared sulphuret of antimony, two pounds.

Boil them in a covered iron pot, over a slow fire for three hours, adding more water if necessary, and frequently stirring the mixture with an iron spatula; strain the liquor while warm through a double cloth, and add to it when filtered, as much diluted sulphuric acid as is necessary to precipitate the sulphuret, which must be well washed with warm water.

When the liquor, obtained by boiling the solution of potass on the sulphuret of antimony, is strained, and al-

lowed to cool, before the sulphuric acid is added, it deposits a red coloured powder, which has been known by the name of *Kermes mineral*, and has been much esteemed in Europe, as an active preparation. When the sulphuric acid is added, it unites with the potass, and the antimonial oxide, combined with parts of the sulphurated hydrogen and sulphur, is precipitated in the form of a light or orange coloured powder, called *sulphur auratum antimonii*.

In its action on the body, the sulphuret of antimony coincides with the kermes mineral: but on account of the larger proportion of sulphur, it must be given in somewhat larger doses; the former not exceeding a grain, or grain and an half; the latter to the extent of five or six grains. They have been employed principally as diaphoretics and sudorifics, but are always uncertain in their operation.

A composition of equal parts of sulphur auratum antimonii and mercurius dulcis, has been found a powerful, yet safe alterative in cutaneous disorders; and has completed a cure, after salivation had failed. In venereal cases, likewise, this medicine has produced excellent effects. [See Pilulæ Plummeri.]

Oxidum Antimonii cum Phosphate Calcis. *Oxide of Antimony with Phosphate of Lime.* Antimonial Powder.

Take of

Sulphuret of antimony in coarse powder,
Shavings of hartshorn, equal weights.

Mix, and put them into a wide red hot iron pot, and stir the mixture constantly, until it be burnt into a matter of a gray colour, which is then to be removed from the fire, ground into powder, and put into a coated crucible. Lute to this crucible another inverted over it, and perforated in the bottom with a small hole, and apply the fire, which is to be raised gradually to a white heat, and kept in that increased state for two hours. Lastly, grind the matter, when cold, into a very fine powder.

This has been introduced into the Pharmacopœias, as affording a preparation, similar to the celebrated empirical remedy, *James' powder*. For the process, we are indebted to Dr. Pearson, of London. By analysis, he

found the genuine powder of Dr. James, to consist of forty-three parts of phosphate of lime, and fifty-seven of an oxide of antimony, part of which was vitrified; and by the above formula he was enabled to prepare a powder, similar to it in qualities and chemical composition.

The theory of the process is sufficiently obvious. During the first stage, the animal matter of the bone is decomposed and burnt out; the sulphur of the sulphuret of antimony is expelled, and the metal is imperfectly oxidated. In the second, the metal is more completely oxidated, partially vitrified, and perhaps brought in combination with the phosphate of lime, which is the residuum of the bones. From Mr. Chenevix's experiments, it appears, that, in this preparation, more of the oxide of antimony is vitrified, than in the genuine James' powder.

The oxide of antimony with phosphate of lime, (James' powder,) is one of the best antimonials we possess. It has been long celebrated as a remedy in febrile affections. It acts as a very general evacuant, occasioning sweat, purging, and frequently vomiting; and, by this general action, appears to arrest the progress of the disease. Its dose is five or six grains, repeated every six hours, until its effects are obtained. It is better adapted to fevers of an inflammatory nature, than to those of the typhoid kind. It has been affirmed, that the preparation obtained by the above process, is neither so certain, nor so powerful in its operation, as the powder of James; eight grains of the former, being not more than equal to six of the latter. The difference, if it exist, may be owing to some peculiarity in the process, by which, perhaps, a difference of oxidation, or of vitrification of the oxide may be occasioned; or according to the opinion of Dr. Fordyce, to the intermixture of a portion of tartarized antimony in the empirical preparation.

Murias Antimonii. *Muriate of Antimony.* Butter of Antimony.

Take of

Oxide of antimony with sulphur, by nitrate of potass,
Sulphuric acid, each one pound,
Dried muriate of soda, two pounds.

Pour the sulphuric acid into a retort, gradually adding the muriate of soda and oxide of antimony previously

mixed. Then perform the distillation in a sand bath. Expose the distilled matter for several days to the air, that it may deliquesce, and then pour the liquid part from the feces.

In this mode of forming muriate of antimony, the muriate of soda is decomposed by the sulphuric acid combining with the soda; the muriatic acid disengaged, unites with the oxide of antimony, and the compound is volatilized. It is at first of a soft consistence, from which it takes the name of butter of antimony, but soon attracts a sufficient quantity of humidity, to render it fluid. If water be poured upon it, it is decomposed, and a sub-muriate of antimony is precipitated.

This preparation is unfit for internal use; externally, it has sometimes been used as a caustic. Decomposed by potass, it affords an oxide, which has been used in preparing the tartrite of antimony.

TARTRIS ANTIMONII. *Tartrite of Antimony.* Emetic Tartar.

Take of

Oxide of antimony with sulphur, by nitrate of potass, three parts,
Super-tartrite of potass, four parts,
Distilled water, thirty-two parts.

Boil in a glass vessel for a quarter of an hour, strain through paper, and set aside the strained liquor to crystalize.

The excess of tartarous acid in the super tartrite of potass, is capable of combining with a number of the metallic oxides, and forming ternary compounds. With oxide of antimony, when not too highly oxidated, it unites with facility, forming a combination of this kind, which constitutes the present preparation. As the tartarous acid is saturated, partly by potass, and partly by oxide of antimony, it is not a pure tartrite of antimony, but a tartrite of antimony and potass. According to the analysis of it by Thenard, it consists of thirty-eight parts of oxide of antimony, thirty-four of tartarous acid, sixteen of potass, and eight of water.

As this is the most important of the antimonial preparations, the processes for obtaining it have been often varied, principally, in the selection of the oxide of antimony employed.

The vitrified oxide is, perhaps, the most unexceptionable; it contains, indeed, a portion of siliceous earth, which accompanies the oxide of antimony in its combination with the tartarous acid; and, when the liquor is considerably evaporated, gives to it a gelatinous consistence: but, before this happens, the greater part of the tartrite of antimony and potass may be procured by crystalization; or, according to Vauquelin's method, the solution may be directly evaporated to dryness, and, on again dissolving the saline matter in water, the silex remains undissolved. The solubility of tartar emetic has been variously stated, and appears to vary, according to the quantity of antimonial oxide contained in it, from proper preparations.

According to Dr. Saunders, one ounce of water at 60°, dissolves fifty-two grains of the fully saturated salt, while of that generally met with, it dissolves from thirty-two to thirty-five. This affords, even a mode of judging of the strength of this preparation. It is very susceptible of decomposition, suffering it not only from alkalis, earths, acids, and a number of neutral salts, but even from vegetable infusions and decoctions; the vegetable matter, attracting apparently part of the oxygen of the oxide. If kept dissolved in water, it is also decomposed, from the spontaneous decomposition of the tartarous acid. Of all the preparations of antimony, this is the most certain in its operation; and, it is almost indispensable in the practice of medicine. In doses from one to eight grains, it operates as an emetic, and sometimes as a cathartic. In smaller doses, it excites nausea, and proves a powerful diaphoretic and expectorant. As an emetic, it is chiefly given in the beginning of fevers, and febrile diseases, in chin cough; and, in general, whenever we wish to evacuate the stomach quickly. When great debility is present, and in the advanced stages of typhoid fever, its use is improper, and even sometimes fatal. As a diaphoretic, it is given in small doses, of from an eighth to a quarter of a grain; as an expectorant, in doses still smaller.

The only proper form for exhibiting it, is in solution; and as the intensity of its action on the body, is liable to variation, from difference in its own strength, and in the constitution of the patient, it should almost always be given in divided doses, at short intervals, if we wish to excite vomiting; and, at longer intervals, if we only wish it to act on the skin and lungs.

Tartrite of antimony in solution is much employed in Europe for increasing the gastric secretions, and maintaining for a length of time a lax state of the bowels. And it is not unfrequently recommended as a stimulating application to the region of the stomach in angina pectoris, and in chin cough.

Panacea Antimonii. *Panacea Antimony.*

Take of

Antimony, six ounces,
Nitre, two ounces,
Common salt, one ounce and an half,
Charcoal, an ounce.

Reduce them to a fine powder, and put the mixture into a red hot crucible, by half a spoonful at a time, continuing the fire a quarter of an hour after the last injection: then, either pour the matter into a cone, or let it cool in the crucible; which, when cold, must be broken to get it out. In the bottom will be found a quantity of regulus; above this, a compact, liver coloured substance; and on the top, a more spongy mass: this last is to be reduced into powder, edulcorated with water, and dried; when it appears of a fine golden colour.

This preparation is found in a former Edinburgh Pharmacopœia, and is supposed to have been the basis of the long celebrated *Lockyer's pills.* Ten grains of the powder, mixed with an ounce of white sugar candy, and made into a mass, with mucilage of gum tragacanth, may be divided into an hundred small pills; of which, one, two, or three, taken at a time, are found to work gently by stool and vomit. The dose should be gradually increased, until the proper effect be produced. Under certain circumstances of the patient, they moderately evacuate the stomach, and in dropsical cases, they have frequently succeeded as one of the most efficacious cathartics. In many cutaneous affections, the use of these pills, when duly persisted in, has been attended with the happiest effects.

SILVER.

NITRAS ARGENTI. *Nitrate of Silver.* Lunar Caustic.

Take of

Purest silver, flatted into plates, and cut in pieces, four ounces,
Diluted nitrous acid, eight ounces,
Distilled water, four ounces.

Dissolve the silver in a phial with a gentle heat, and evaporate the solution to dryness. Then put the mass into a large crucible, and place it on the fire, which should at first be gentle, and afterward increased by degrees, till the mass flow like oil; then pour it into iron pipes, previously heated and anointed with tallow. Lastly, let it be kept in a glass vessel well closed.

The silver, in this process, is oxidated and dissolved by the nitrous acid. By the subsequent fusion, part of the acid is expelled; so that this is rather a sub-nitrate, than a nitrate of silver. It is a strong caustic, and possesses the advantage of being easily applied. It is, therefore, the one in most general use, for consuming fungous excrescences, callous edges, warts, strictures in urethra, and the like. It is also employed to destroy the venereal poison in chancres, before it has operated on the system. A weak solution of it may be applied as a stimulus to indolent ulcers, or injected into fistulous sores.

Notwithstanding its causticity, it has been given internally. Boerhaave, Boyle, and others, commend it highly in hydropic cases. The former assures us, that made into pills, with crumb of bread, and a little sugar, and taken on an empty stomach, (some warm water sweetened with honey, being drank immediately after) it purges gently, without griping, and brings away a large quantity of water, almost without the patient's perceiving it; that it kills worms, and cures many ulcerous disorders. He nevertheless cautions against using it too freely, or in too large a dose, and observes, that it always proves corrosive, and weakens the stomach.

It has been more recently employed, and with success, in epilepsy and angina pectoris. The former disease, when not depending on organic derangement, is frequently

connected with morbid susceptibility, and which tonics sometimes remove. The advantage derived from the administration of nitrate of silver has been established on the testimony of Dr. Sims, Dr. Cappe, Dr. Bostic, and others. The dose is a quarter of a grain of the crystalized nitrate, which may be given three or four times a day. Distilled water must be employed to dissolve it, as spring water would decompose it; and the solution may be made into pills with bread. It sometimes acts as a cathartic, and if it occasion much cathartic effect with griping, or excite nausea, the dose must be diminished. Dr. Cappe has related a case of angina pectoris, the symptoms of which were removed by a similar administration of nitrate of silver.

COPPER.

AMMONIARETUM CUPRI. *Ammoniaret of Copper.* Ammoniacal Copper.

Take of

Purest sulphate of copper, two parts,
Carbonate of ammonia, three parts.

Rub them carefully together in a glass mortar, until after the effervescence have entirely ceased; they unite in a violet coloured mass, which must be wrapped up in blotting paper, and first dried on a chalk stone, and afterwards by a gentle heat. The product must be kept in a glass phial well closed.

The sulphate of copper is decomposed by the carbonate of ammonia. One portion of ammonia combines with the sulphuric acid, another portion of it unites with the oxide of copper; and the violet coloured mass which is formed, is a mixture of the two resulting compounds: the carbonic acid is disengaged with effervescence.

This preparation has sometimes been serviceable in epilepsies, but, from its frequent want of success, and the disagreeable consequences with which its use is sometimes attended, it has not lately been much prescribed. It is employed by beginning with doses of half a grain twice a day; and increasing them gradually to as much as the stomach will bear. Dr. Culien sometimes increased the dose to five grains.

SOLUTIO SULPHATIS CUPRI COMPOSITA. *Compound Solution of Sulphate of Copper.* Styptic Water.

Take of

Sulphate of copper,
Super-sulphate of alumina and potass, each three ounces,
Water, two pounds,
Diluted sulphuric acid, an ounce and a half.

Boil the sulphates in the water to dissolve them, and then add the acid to the liquor filtered through paper.

This is merely a combination of powerful astringents. It has been applied topically to check hæmorrhagy, and, largely diluted with water, as a wash in purulent ophthalmia. This preparation, or a similar one made extemporaneously, in doses of fifteen or twenty drops, often repeated, will be found a remedy of superior efficacy and speedy relief in obstinate menorrhagia.

IRON.

FERRI LIMATURA PURIFICATA. *Purified filings of Iron.*

Let a piece of pure iron be filed with a clean file, then place a sieve over the filings, and apply a magnet, so that the filings may be attracted upwards through the sieve.

The iron is in this manner obtained nearly pure, the interposition of the sieve in a great measure preventing particles of other metals, or impurities which are generally mixed with the iron filings, got from the workshops, from being entangled in the cluster which adheres to the magnet. The scales of the oxide of iron, which are to be found at the foot of the blacksmith's anvil, are also to be purified by the application of the magnet. For the magnet will only attract the smaller, and purer scales, and will leave those which are larger, and less pure.

OXIDUM FERRI NIGRUM PURIFICATUM. *Purified Black Oxide of Iron.* Purified Iron Scales.

Let the scales of the oxide of iron, which are to be found at the foot of the blacksmith's anvil, be purified by

the application of a magnet. For the magnet will attract only the smaller and purer scales, and will leave those which are larger and less pure.

Carbonas Ferri. *Carbonate of Iron.* Rust of Iron.

Moisten purified filings of iron frequently with water, that they may be converted into rust, which is to be ground into an impalpable powder.

During exposure to air and moisture, iron is oxidated, and this oxide is found to be combined with carbonic acid, absorbed, probably from the atmosphere.

As a chalybeate, it is more active than the pure metal, and more mild than the other saline combinations of iron. Its dose is from ten to twenty grains.

Carbonas Ferri Præcipitatus. *Precipitated Carbonate of Iron.*

Take of

Sulphate of iron, four ounces,
Carbonate of soda, five ounces,
Water, ten pounds.

Dissolve the sulphate in the water, and add the carbonate of soda, previously dissolved, in a sufficient quantity of water, and mix them thoroughly.

Wash the carbonate of iron, which is precipitated, with warm water, and afterwards dry it.

On mixing the solutions of these salts together, there is an immediate mutual decomposition. Sulphate of soda is formed, which remains in solution, and carbonate of iron, which is precipitated of a green colour. The precipitate, when first formed, is the carbonate of black oxide of iron, or contains the iron, in the state of black oxide, the state in which it exists in the green sulphate of iron; but in the process of drying, it absorbs more oxygen, becomes of a red colour, and is converted into the carbonate of red oxide of iron.

The carbonate of iron is an excellent and safe chalybeate. It may be given as a tonic, in doses of from five to thirty grains; but all chalybeates answer better in small doses, frequently repeated, than in large doses. The formula of Dr. Griffiths, which has been highly celebrated as a chalybeate, is an extemporaneous preparation of this kind.

AQUA SUPER-CARBONATIS FERRI. *Solution of the Super-Carbonate of Iron.*

It is prepared in the same manner as the water of carbonic acid, by suspending in the water half an ounce of iron wire.

This is a very elegant chalybeate. The iron is in a state of black oxide, and is dissolved by means of carbonic acid. It was first prepared by Bergman, in imitation of the natural chalybeate waters, and it forms an excellent substitute for them.

SULPHAS FERRI. *Sulphate of Iron.* Salt of Steel.

Take of

Purified filings of iron, six ounces,
Sulphuric acid, eight ounces,
Water, two pounds and a half.

Mix them, and after the effervescence ceases, digest the mixture for some time upon warm sand: then strain the liquor through paper, and after due evaporation, set it at rest to crystalize.

The sulphuric acid, by a disposing affinity, enables the iron to attract the oxygen of the water with rapidity, and unites with the oxide thus formed. This oxide is at the *minimum* of oxidation, and the salt which it forms is named the green sulphate of iron, to distinguish it from the red sulphate, in which the metal is more highly oxidized. This green sulphate is prepared for the various purposes for which it is used in the arts, on a large scale, by exposing the native sulphuret of iron to air and moisture; but it is impure: By the present process, it is obtained in a state of greater purity.

Sulphate of iron is one of the most active preparations of the metal, and is frequently employed in cachectic and chlorotic cases, for exciting the uterine discharges, strengthening the tone of the viscera, and destroying worms. Its medium dose is from three to five grains.

The common green vitriol, or copperas, is sometimes substituted for this preparation: but the former, often containing zinc or copper, is too impure for internal use.

Sulphas Ferri Exsiccatus. *Dried Sulphate of Iron.* Calcined Vitriol.

Take of

Sulphate of iron, any quantity.

Expose it to the action of a moderate heat in an unglazed earthen vessel, until it become white and perfectly dry. The heat applied here must not be so great as to decompose the sulphate of iron, but only to deprive it of its water of crystalization.

This is merely the sulphate of iron, freed from its water of crystalization. It was never medicinally employed, and has a place in the Pharmacopœia, only from being employed in one or two pharmaceutical preparations.

Oxidum Ferri Rubrum. *Red Oxide of Iron.* Colcothar of Vitriol.

Expose dried sulphate of iron to an intense heat, until it be converted into a very red matter.

By an intense heat, sulphate of iron is decomposed; its acid is partly expelled, and in part suffers decomposition. The red oxide is the residuum. It is scarcely medicinally employed, but is used in some pharmaceutical preparations.

Murias Ammoniæ et Ferri. *Muriate of Ammonia and Iron.* Martial Flowers.

Take of

Red oxide of iron, washed and again dried.
Muriate of ammonia, equal weights.

Mix them thoroughly and sublime.

Oxide of iron decomposes muriate of ammonia, by attracting the muriatic acid, and, in the present process, this decomposition takes place. But, from the proportion of the substances employed, part of the muriate of ammonia escapes decomposition; it is sublimed by the heat applied, and elevates along with it, part of the muriate of iron that had been formed. The process, therefore, is rather an unscientific mode of obtaining a muriate of

iron: the preparation too, has been found uncertain in strength, more or less of the muriate of iron being sublimed, according to the heat applied; and, accordingly, it has now fallen into disuse. It has been found serviceable in hysterical and hypochondriacal cases, and in distempers proceeding from a laxity and weakness of the solids; as the rickets. From two or three, to ten grains, may be conveniently taken in the form of bolus.

MISTURA FERRI COMPOSITA. *Compound mixture of Iron.* (Lond. Phar.)

Take of

Myrrh powdered, a drachm,
Sub-carbonate of potass, twenty-five grains,
Rose water, seven ounces and a half,
Sulphate of iron powdered, a scruple,
Spirit of nutmeg, an ounce,
Refined sugar, a drachm.

Rub together the myrrh, the sub-carbonate of potass and sugar, and during the trituration, add gradually; first, the rose water and spirit of nutmeg, and last the sulphate of iron. Pour the mixture immediately into a proper glass bottle, and stop it close.

This, with a few trivial alterations, is the celebrated antihectic mixture of Dr. Griffith, and is now introduced from the London pharmacopœia, for the purpose of giving precise directions for its preparation. As first invented, says Mr. Murray, it was undoubtedly an unchemical mixture, the prescriber not being aware of the changes produced in the active ingredients by their mutual action, but which, in practice, was found possessed of peculiar advantages. The sulphate of iron, it is obvious, is decomposed by the sub-carbonate of potass, the sulphuric acid combining with the potass, while the carbonic acid unites with the oxide of iron. The carbonate of iron which is formed is diffused in the mixture along with the myrrh, and both are probably kept more completely suspended by an excess of alkali. This chalybeate proves much less irritating than the sulphate of iron, producing no unpleasant effect on the stomach, and at the same time it is more active than the common carbonate or rust of iron, in which the iron is at the maximum of oxidation, while, in the present preparation, it is at the minimum.

is in a different state of aggregation, and probably combined with a larger quantity of carbonic acid. To preserve it in this low state of oxidation, it is ordered to be kept in a bottle closely stopped; but as iron has a strong tendency to pass to a more highly oxidated state, and suffers this change very rapidly from the action of the air, it is preferable that the preparation should be always extemporaneously made. Griffith's mixture was employed as a remedy in hectic fever, in chlorosis, and other diseases, in which iron is given as a tonic. The mixture of the London pharmacopœia, which is nearly of the same strength, may be given in the same cases, in a dose of an ounce, once or twice a day. It is employed with the greatest success in those cases of hectic fever which are unattended by any great degree of heat or thirst, and which do not show manifest signs of inflammation. It will in general be found to sit easy on the stomach; but should it disagree, or should hectic fever and flushings prevail to a high degree, the proportion of the ingredients may be changed, or the sulphate of iron altogether omitted.

QUICKSILVER.

Hydrargyrus Purificatus. *Purified Quicksilver.*

Take of

Quicksilver, four parts,
Purified filings of iron, one part.

Rub them together, and distill from an iron vessel.

Quicksilver is sometimes adulterated with other metals. To obtain it perfectly pure, is the design of this process. The addition of the iron filings renders the distilled quicksilver more bright and mobile, an effect not perfectly explained, but ascribed to the iron retaining combined with it any foreign metal, or any portion of carbon that might have been contained in the quicksilver.

Acetis Hydrargyri. *Acetite of Quicksilver.*

Take of

Purified quicksilver, three ounces,
Diluted nitrous acid, four ounces and a half, or a little more than may be required for dissolving the quicksilver,

Acetite of potass, three ounces,
Boiling water, eight pounds.

Mix the quicksilver with the diluted nitrous acid, and after the effervescence has ceased, digest if necessary, with a gentle heat, until the quicksilver be entirely dissolved. Then dissolve the acetite of potass in the boiling water, and immediately to this solution, still hot, add the former, and mix them by agitation. Then set the mixture aside to crystalize. Place the crystals in a funnel, and wash them with cold distilled water; and, lastly, dry them with as gentle a heat as possible.

In preparing the acetite of quicksilver, it is important that all the vessels and funnels employed, be of glass.

For making the acetite of mercury, the nitrate is prepared with a very gentle heat; and with excess of acid, that it may be retained in perfect solution, and that there may be no possibility of any admixture of subnitrate with the acetite formed. A larger proportion of acid is used by the Edinburgh College, than by the other Colleges; but we believe it to be unnecessary. In mixing the solutions, we must be careful to pour the mercurial solution into the acetite of potass, because by adopting the contrary procedure, subnitrate of mercury will be precipitated undecomposed, if any of it be contained in mercurial solution.

For dissolving the acetite of potass, the London and Dublin Colleges only use as much water as is capable of retaining the nitrate of potass in solution: the acetite of mercury is therefore precipitated, and is purified by again dissolving it in boiling water, and crystalizing it. This part of the process is simplified by the Edinburgh College, who use as much water for dissolving the acetite of potass, as is capable of retaining, as long as it is hot, the acetite of mercury in solution, and of allowing it to crystalize as it cools. In this way, therefore, it is procured at once sufficiently pure.

The exsiccation of the acetite of mercury, is an operation of great delicacy; for it is so spongy, that it retains the moisture with great obstinacy; and it is decomposed so easily, that heat can scarcely be employed. It is best dried, by compressing it between several folds of bibulous paper.

Acetite of mercury is scarcely soluble in cold water, but dissolves very readily in boiling water.

As an anti-syphilitic remedy, it is very mild in its operation; but its effects are not considered as sufficiently

permanent, to warrant its effecting a radical cure; although it was the active ingredient of the celebrated Keyser's pills. Its dose is a grain, night and morning. In solution, it has also been recommended externally, to remove freckles and cutaneous eruptions.

Murias Hydrargyri. *Muriate of Quicksilver.* Corrosive Sublimate.

Take of

Purified quicksilver, two pounds,
Sulphuric acid, two pounds and a half,
Dried muriate of soda, four pounds.

Boil the quicksilver with the sulphuric acid in a glass vessel, placed in a sand bath, until the matter be dried. Mix the matter when cold, in a glass vessel, with the muriate of soda, then sublime in a glass cucurbit, with a heat gradually increased. Lastly, separate the sublimed matter from the scoriæ.

In the first stage of this process, the sulphuric acid oxidizes the mercury, and combines with the oxide; and, by the heat applied, the salt thus formed is that which contains the metal in a high state of oxidizement. This salt, in its dry state, is mixed with muriate of soda, and, by the application of heat, a double decomposition is effected; the soda attracts the sulphuric acid, and the muriatic acid combines with the oxide of mercury. The muriate of mercury being easily volatilized, is separated from the sulphate of soda by sublimation.

According to the analysis of muriate of mercury by Mr. Chenevix, the compound consists of mercury in a high state of oxidation united with muriatic acid; the oxide, which is its basis, he concluded, consists of eighty-five of mercury and fifteen of oxide; and one hundred parts of the salt are composed of eighty-two of this oxide and eighteen of muriatic acid. Its ultimate principles, therefore, and their proportions are 18 of acid, 12.3 of oxygen, and 69.7 of quicksilver. Zaboada, from a more recent analysis, has infered, that the oxide does not contain more than ten of oxygen in one hundred parts, and that eighty of this oxide are combined with twenty of acid. According to this, the ultimate principles and their proportions will be twenty of acid, eighty-five of oxygen, and 71.5 of quicksilver. The muriate of mercury is so-

luble in water and in alcohol, has a taste styptic and metallic, and exerts a degree of escharotic power. It turns several vegetable colours to a green; is decomposed by the alkalis and earths, and by a number of compound salts, and likewise by vegetable infusions.

Mercury, says Mr. Murray, oxidated and combined with muriatic acid, forms two very active preparations, differing in the degree of oxidation, and in the proportion of acid with which the oxide is combined. The one has been long known by the name of *Corrosive Sublimate* of *mercury*, the other by that of *Mild Sublimate* or *Calomel*. The former is now named Muriate of Quicksilver by the Edinburgh College, and Oxymuriate of Quicksilver by the London College; the latter, by both Colleges, submuriate of mercury; names not sufficiently distinctive, and chemically incorrect. The old distinguishing epithets are still the least ambiguous, and even as a chemical nomenclature are properly used.

Corrosive muriate of mercury is the most powerful of the mercurial preparations. According to Murray, its dose cannot safely exceed the fourth of a grain, nor can more than one grain be given in twenty-four hours. As an antisyphilitic remedy it acts speedily, and its action is more general on the system, or less determined to particular organs: These advantages have led to its frequent use, especially under the form of various empirical remedies, which have been employed in the treatment of syphilis. They are more than counterbalanced, however, by the occasional violence of its operation, and by the uncertainty which attends it, so that it cannot be relied on in establishing a permanent cure.

In other diseases besides lues venerea, it is occasionally exhibited, particularly in cutaneous affections. Externally, its solution is employed as an escharotic in chancre and venereal ulcers of the mouth; and a very dilute solution of it has been used as an injection, to excite inflammation in obstinate gleet, and also as a collyrium in venereal ophthalmia, and a lotion in some cutaneous affections. But even externally its use requires some caution.

Corrosive sublimate was highly praised for its antisyphilitic virtues by the celebrated Van Swieten, but in modern medicine there is a diversity of opinion relative to the subject. Mr. Pearson says that it will sometimes cure the primary symptoms of syphilis, especially if it

produce considerable soreness of the gums, and the common specific effects of mercury in the system; but it will often fail, and will not secure the patient from a constitutional affection. It is on some occasions, however, a useful auxiliary to a mercurial course, in quickly bringing the system under the influence of mercury, and in supporting its action after the use of frictions, and is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the desquamation of eruptions. On some occasions during the use of this medicine new symptoms will appear, and it will fail of affording the least advantage to the patient from first to last; and on no account does he think it safe to confide in this preparation singly and uncombined, for the cure of any truly venereal symptoms.

In the discussion however, of this subject by Dr. Frances, as mentioned when speaking of mercury in the Materia Medica, we find names of great celebrity, who, since the year 1754 have been the advocates for this form of mercury, and who have made the most favourable reports of its antivenereal powers. Among these, Dr. Locher of the Vienna hospital is adduced, as having cured, from the year 1754 to 1762, no less than 4880 persons by this preparation alone, without inducing salivation, or the least painful or dangerous symptoms whatever. But the writer farther substantiates his favourable opinion of corrosive sublimate by the respectable testimony of Professor Hosack, who for the last 17 years has employed it for the removal of lues venerea in its various stages with uniform success. In the course of the extensive private and public practice of the Professor, no disappointment was experienced, not a case occurred in which the cure has not been permanent. By a cautious administration of the medicine, salivation was scarcely ever induced, and those injurious effects upon the stomach and bowels which are so greatly apprehended, were also avoided. In the spring of the year 1811, the antivenereal powers of corrosive sublimate were again put to the fairest experiment in the New York hospital, by Mr. I. Cheesman, the house surgeon, and complete success was the result of the numerous instances of trial. Since that period the use of this medicine has been more generally adopted and approved. It appears, therefore, from the authority adduced, that of all mercurials, the corrosive sublimate soonest affects the system, and suspends the action of the vene-

real virus; that it is the most mild, safe, and certain remedy, and that it ought to be prefered in every instance of syphilis. As a proof of its comparative mildness, Dr. F. affirms, that when given to delicate children, or even infants, labouring under some hereditary taint, obstinate eruptive disease, or other symptoms indicating an alterative course, it has never in his practice, or that of Professor Hosack, induced pernicious effects, excepting that an over dose will excite some nausea. For these delicate subjects, two grains of the sublimate are dissolved in one ounce of common brandy, of which four drops to a child of one year, and six or eight to one of three years, are given three times a day in a little sweetened water. After its use two or three days the dose may be a little increased. As an antivenereal remedy in the various stages of syphilis, it is administered either in the form of spirituous solution or of pills; the latter is generally to be prefered. To fifteen grains of the corrosive sublimate add the same quantity of the muriate of ammonia; having well rubbed them together, pour on one drachm of pure water, combine with the mixture a sufficient quantity of the crumb of stale wheat bread to absorb all the fluid, and divide the mass into one hundred and twenty pills. One of these is to be taken every night and morning, though in some aggravated cases another pill may be taken in the middle of the day. Thus a quarter of a grain of this preparation will be taken in twenty-four hours without any inconvenience, though the same quantity in the form of solution might induce nausea, and some serious derangement of the stomach and bowels. The employment of the medicine ought in general to be continued two or three weeks after the disappearance of the disease, in order to effect with more certainty a radical cure. As auxiliary to the above course, the decoction of guaiacum and sarsaparilla was employed, and attended with advantage. On some occasions mucilaginous diluents and the use of opium may appear requisite to obviate any irritation excited by an over dose of the medicine.

Ganglions of the tendons may be effectually removed by injecting a solution of corrosive sublimate into an incision made for that purpose.

This active medicine is too frequently resorted to by the most unqualified persons, and taken in a very unwarrantable manner. While writing on this article application was made by a sea captain for twenty grains of sublimate,

and twelve grains of the oxide of arsenic, to be dissolved in one ounce of liquid laudanum! Ten or twelve drops of such compound he had been taking, he said, twice a day for several weeks without experiencing any particular effect.

In the Contributions of Medical Knowledge by the late Dr. Beddoes, it appears that Mr. Addington has adopted a mode of effecting a rapid salivation for the cure of gonorrhœa virulenta with the corrosive sublimate dissolved in rectified spirit of wine. He asserts that he has cured hundreds in a very short time in this manner, without the least disagreeable consequence. Three grains of the sublimate are to be dissolved in one ounce of rectified spirit of wine. Half of this mixture is to be taken undiluted at going to bed; it produces a copious salivation for an hour and a half or longer, and the patient spits a quart. Some Glauber's salts are to be taken on the second day after this operation, and on the evening of that day he is to repeat the draught, and the salts on the day but one following. Dr. Darwin has suggested the administration of corrosive sublimate in the same manner, with the design of exciting a rapid salivation as a remedy in hydrophobia.

Sub-Murias Hydrargyri. *Sub-Muriate of Quicksilver.* Calomel.

Take of

Muriate of quicksilver, ground to powder in a glass mortar, four ounces,
Purified quicksilver, three ounces.

Rub them together in a glass mortar, with a little water, to prevent the acrid powder from rising, until the quicksilver be extinguished; and having put the powder, after being dried, into an oblong phial, of which it fills one third, sublime from warm sand. After the sublimation is finished, having broken the phial, throw away both the red matter found near the bottom of the phial, and the white matter near its neck, and sublime the rest of the mass. Grind this into a very minute powder, which is, lastly, to be washed with boiling distilled water.

In this process, the directions for performing which are sufficiently explicit, an additional quantity of quicksilver is brought into chemical union with the constituent principle of muriate of mercury. In that compound,

the metal is highly oxidated, and the oxide is combined with a considerable quantity of muriatic acid. In converting it into the sub-muriate of mercury, as it is named, the portion of metal which is added attracts part of the oxygen of the oxide, and the whole becomes an oxide of mercury with a comparatively small portion of oxygen; and this oxide, requiring less muriatic acid for its saturation than the one more highly oxidated, finds a sufficient quantity in the pre-existing muriate. The one is merely imperfect oxide of mercury combined with muriatic acid; the other perfect oxide of mercury united to the same acid, the latter at the same time containing more acid in its composition than the former. Mr. Chenevix's analysis, has fixed the proportions with accuracy.

Those of the muriate, as it has been named, have been already stated; those of the submuriate are, muriatic acid, 11.5, oxide of mercury, 88.5, [this oxide being composed of quicksilver, 89.3, and oxygen, 10.7;] so that the ultimate constituent parts of sub-muriate of mercury, are, quicksilver, 79, oxygen, 9.5, and muriatic acid, 11.5.

The names which have been chosen to distinguish these two muriates of mercury, are not, in the opinion of Mr. Murray, the best that might have been selected. In a chemical point of view, the prefixing the syllable sub, to denote the one, is incorrect, since the use of that syllable is restricted to those salts, in which the case is the same, but when there is a deficiency of acid; and, in the muriate to which it is here applied, the case is not the same, and there is no deficiency of acid, the metallic oxide being saturated, or combined with as much as it is disposed to unite with. As a medical nomenclature, the adoption of it is still more to be regretted, as the merely prefixing the syllable to the same name is insufficient to guard effectually against the dangerous mistake of confounding preparations which differ so widely in their powers.

The epithets *corrosive* and *mild*, have long been made use of, to discriminate them; they do so more clearly, and, as systematic names, they are preferable, as according with the established nomenclature of the metallic salts, which draws the distinctions between the salts formed from the different oxides of the same metal, united with one acid, from some quality in which they differ. The one preparation ought to have been named *murias hydrargyri corrosivus*; the other, *murias hydrargyri mitis*.

This preparation of mercury, differs from the former, in being perfectly insipid, and insoluble in water or in alcohol. By sublimation it may be obtained in small, short prisms, but it is usually in the form of a mass, somewhat ductile, semi-transparent, and very heavy. It is decomposed by the alkalis, earths, and various compound salts.

A method has lately been introduced by Mr. Howard, of conducting the sublimation in an apparatus, so constructed, that the vapours are not condensed in the upper part of the vessel, forming a solid mass, but are condensed on the surface of water. The aggregation, whence a certain degree of ductility and hardness arise, that renders difficult the levigation of the sublimate, is thus obviated; it is obtained at once, in the state of a fine powder, and any corrosive muriate that may rise with it is abstracted.

The mild muriate of mercury, or calomel, as it is safer to prescribe it by the arbitrary name by which it has been long known, is one of the most useful preparations of the metal. By proper management, it may be made to increase, in a remarkable manner, almost any of the secretions, or excretions. As an anti-venereal, it is given in the dose of a grain, night and morning; or in larger doses, its usual determination to the intestines being prevented, if necessary, by opium. Thus directed, this preparation is capable of curing syphilis in every form. It is the preparation, which is, perhaps, most usually given in the other diseases in which mercury is employed, as in affections of the liver, or neighbouring organs, in cutaneous diseases, chronic rheumatism, tetanus, hydrophobia, hydrocephalus, and febrile affections, especially those of warm climates. It is employed as a cathartic alone, or to promote the operation of other purgatives. With jalap it forms the favourite cathartic of Dr. Rush, in bilious and in yellow fevers; with rhubarb, it is highly extolled by sir John Pringle, in dysentery. Its anthelmintic power is justly celebrated; and it is perhaps superior to the other mercurials, in assisting the operation of diuretics in dropsy. Combined with diuretics, it proves diuretic; and with sudorifics, sudorific. It also produces very salutary effects in obstructions, and chronic inflammations of the viscera, especially of the liver; and in general, either with or without opium, it is applicable to every case, in which mercurials are indicated. Combined

in the proportion of one part of opium to four of calomel, it is administered with very great success in almost every form of active inflammation. As a vermifuge, says a late writer, "repeated experience has convinced me, that no remedy is so safe, so mild, or so certain, as *calomel*. Procure the medicine from an apothecary of character, give it in the dose suited to the age and constitution of the child, and keep him warm during the operation, avoiding cold and sour drinks, for two or three days, and no danger can ever attend the use of the remedy. Rhubarb or jalap may be mixed with the calomel to quicken the operation. A nausea, which sometimes comes on during the operation, may be relieved by mint water; and an unnecessary purging may be restrained by two or three drops of *laudanum*. A child, between the ages of two and four years, in general, may take from one to three grains at a dose in syrup." From its great specific gravity, it ought always to be given in the form of bolus or pill.

In *cholera infantum*, its superior efficacy is confirmed by ample experience, as appears by an excellent dissertation upon that disease, by Dr. James Mann, which gained the Boylstonian prize for the year 1803.

As a cathartic, its dose for an adult may be from five to ten or twenty grains or more. It is worthy of remark that when taken in a dose of twenty-five or thirty grains, calomel operates with less disturbance to the system than when a dose of six or eight grains is given. The larger dose exciting an action adequate to its own expulsion, while the smaller quantity occasions a continual irritation on the coats of the intestines. Calomel within a few years, has been extensively used as a medicine. It should never be trifled with; and, during its exhibition, confinement to an equable temperature in a room, is indispensable. The best way to give it, is in small doses regularly, so that the effects may be gradually exerted on the system; and the impression once made, should be carefully kept up as long as is necessary, to prevent much loss of time.

The patient who commences a course of mercury, besides beginning with small doses and proceeding gradually, should be careful not to stimulate the salivary glands either by rubbing or keeping the parts too warm with flannel. He should likewise avoid as much as possible any exposure to cold which will endanger inflammation, and tumefaction of these glands and thereby give rise to a

salivation. His diet should consist of plain animal food, thin broths, puddings, milk, vegetables, ripe fruit, &c. carefully avoiding all salted and high seasoned meats, spirituous liquors and acids; and in fact abstaining from every substance of a heating or stimulating nature. Mercury has been used with success in consumption: and several cases of its happy exhibition are related by Dr. Rush, in the Medical Repository, vol. 5.

One grain of calomel mixed with sugar, and snuffed up the nostrils, is recommended as a powerful errhine in amaurosis. The same mixture is blown into the eye to remove specks from the cornea.

The general use of that excellent medicine *calomel*, says the judicious writer above refered to, renders its perfect preparation a matter of great importance.

The following method to determine its purity is given by an able chemist, Mr. Frederick Accum.

"Calomel ought to be perfectly saturated with mercury. Complete saturation can only be known, by boiling for a few minutes, one part of calomel and one twelfth part muriate of ammonia in ten parts of distilled water. The fluid must then be filtrated and examined by means of carbonate of potass. If the calomel be well prepared, no change will take place on the addition of this re-agent; but, if the preparation be imperfect, a precipitate will ensue, forty-seven parts of which indicate forty-eight of muriatic acid. One hundred and fourteen parts of calomel perfectly saturated with mercury contain ninety-seven of metal, and nineteen of acid. It should be perfectly inodorous and tasteless, and when rubbed in a stone mortar with ammoniae, become intensely black."

Sub-Murias Hydrargyri Præcipitatus. *Precipitated Sub-Muriate of Quicksilver.* Calomel.

Take of

Diluted nitrous acid,
Purified quicksilver, each eight ounces,
Muriate of soda, four ounces and a half,
Boiling water, eight pounds.

Mix the quicksilver with the diluted nitrous acid, and towards the end of the effervescence digest with a gentle heat, frequently shaking the vessel in the mean time. But it is necessary to add more quicksilver to the acid

than it is capable of dissolving, that a perfectly saturated solution may be obtained.

Dissolve at the same time, the muriate of soda in the boiling water, and into this solution pour the other, while still hot, and mix them quickly by agitation. Pour off the saline liquor after the precipitate has subsided, and wash the sub-muriate of quicksilver by repeated affusions of boiling water, which is to be poured off each time after the deposition of the sub-muriate, until the water come off tasteless.

Mild muriate of mercury is in this process obtained by a double elective attraction. On mixing together the solutions of nitrate of mercury and muriate of soda, the nitric acid is attracted by the soda, and the muriatic acid by the oxide of mercury. In order that the mild, and not the corrosive muriate should be formed, it is evident, that the mercury in the nitrous acid should be in its least oxidated state. Mild muriate of mercury, prepared in this mode, is precisely the same in its chemical composition, as when formed by the former process of sublimation. It has been supposed, however, that it differs somewhat in its operation, and that in particular it is more liable to purging. If such difference ever existed, it is probably owing to the presence of the subnitrate of mercury, which, when the usual directions are observed, may be mixed with the mild muriate. If the latter be pure, its operation must be the same as that of the muriate prepared by sublimation, as it differs from it only in being of a much finer powder than the other can be reduced to, and this has been supposed to give it some superiority.

Sub-Murias Hydrargyri et Ammoniæ. *Sub-Muriate of Quicksilver and Ammonia.* White Precipitate of Mercury.

Take of

Muriate of quicksilver,
Muriate of ammonia,
Solution of carbonate of potass, each half a pound.

Dissolve first the muriate of ammonia, afterwards the muriate of quicksilver, in distilled water, and add to these the solution of carbonate of potass. Filtrate and wash the powder until it become insipid.

The theory of this process is somewhat complicated. The potass decomposes the muriate of ammonia, by combining with the muriatic acid; and the disengaged ammonia decomposes the muriate of mercury. Hence, if ammonia be added to a solution of corrosive muriate of mercury, the same preparation is obtained as by this process. The action of the ammonia in decomposing the corrosive muriate of mercury, is also somewhat peculiar. It does not merely attract the muriatic acid, and separate the pure mercurial oxide, but this oxide retains combined with it a portion both of the ammonia and acid. It is, therefore, a triple compound, consisting, (according to Fourcroy's analysis of it by decomposing it by heat,) of eighty-one parts of oxide of mercury, sixteen of muriatic acid, and three of ammonia.

This preparation, sub-murias hydrargyri et ammoniæ, formerly known by the name of *white precipitate of mercury*, is used, only externally in the form of ointment, as an application in some cutaneous affections.

Oxidum Hydrargyri Cinereum. *Ash-coloured Oxide of Quicksilver.* Ash-coloured powder of Mercury.

Take of

Purified quicksilver, four parts,
Diluted nitrous acid, five parts,
Distilled water, fifteen parts,
Solution of carbonate of ammonia, a sufficient quantity.

Dissolve the quicksilver in the nitrous acid; then gradually add the distilled water, and pour into the mixture as much water of the carbonate of ammonia as shall be sufficient to precipitate the whole of the oxide of quicksilver; which is then to be washed with pure water and dried.

In this process, the nitric acid oxidates the mercury, and combines with the oxide. The action of ammonia on the nitrate of mercury, is peculiar: it does not merely decompose it by combining with the acid, and separating the oxide, but it exerts a farther action on the oxide, partially deoxidating it, by part of its hydrogen attracting a part of the oxygen. The oxide precipitated, therefore, is that in which the metal is combined with the least proportion of oxygen.

In order, however, that this may be the nature of the precipitate, it is necessary that the solution of the mercury in the nitric acid should have been made in the cold, and with a diluted acid. When, from these circumstances not having been attended to, the mercury has been too highly oxidated, ammonia throws down from the solution a white precipitate; and the present preparation is often met with, of a light gray colour, from the intermixture of this precipitate, with the dark coloured oxide. When properly prepared, it is of a dark blue colour.

Ash-coloured oxide of mercury is very similar in its operation, to the preparations in which quicksilver is oxidated by tritnration. It is given as an antivenereal, in a dose of one grain night and morning, generally in the form of pill.

Oxidum Hydrargyri Rubrum, per Acidum Nitricum. *Red Oxide of Quicksilver, by Nitric Acid.* Red precipitated Mercury.

Take of

Purified quicksilver, one pound,
Diluted nitrous acid, sixteen ounces.

Dissolve the quicksilver, and evaporate the solution, with a gentle heat, to a dry white mass; which, after being ground into powder, is to be put into a glass cucurbit, and to have a thick glass plate laid upon its surface. Then, having adapted a capital, and placed the vessel in a sand bath, apply a gradually increased heat, until the matter be converted into very red scales.

The quicksilver is in this preparation first oxidated by the nitrous acid, and then combined with a portion of it. By the increase of heat, this nitrate is decomposed, and the greater part of the acid expelled: it is doubtful, however, if it be ever wholly expelled, so as to leave a pure oxide, the preparation being different in appearance from the red oxide, obtained by the heat, and being always much more acrid. It is too much so for internal use. It is principally used externally, as an escharotic.

Sub-Sulphas Hydrargyri Flavus. *Yellow Sub-Sulphate of Quicksilver.* Turpeth Mineral.

Take of

Purified quicksilver, four ounces,
Sulphuric acid, six ounces.

Put them into a glass cucurbit, and boil them in a sand bath to dryness. Throw into boiling water the white matter, which is left in the bottom, after having reduced it to powder. A yellow powder will immediately be produced, which must be frequently washed with warm water.

The quicksilver is first oxidized by the sulphuric acid, and afterwards combined with it, forming super-sulphate of mercury, by the continuance of the heat, this is partially decomposed, and a sub-sulphate of mercury remains. On this, boiling water is poured; a portion of sulphate of mercury still present in the saline matter is dissolved; and the yellow powder which remains is an oxide of mercury, with a small quantity of sulphuric acid combined with it.

It is a strong emetic, and with this intention, operates more powerfully than any of the mercurials which can be safely given internally. Its action, however, is not confined to the primæ viæ; it will sometimes excite a salivation if a purgative be not taken soon after it. This medicine is chiefly used in virulent gonorrhœas, and other venereal cases, when there is a great flux of humors to the parts. Its chief use at present is in swellings of the testicle from a general affection; and it seems not only to act as a mercurial, but also, by the vomiting it occasions, to perform the office of a discutient, by accelerating the motion of the blood in the parts affected.

It is said, likewise, to have been employed with success, in robust constitutions, against leprous disorders, and obstinate glandular obstructions; the dose is from two to six or eight grains. It may be given in doses of a grain or two, as an alterative and diaphoretic. It is a violent errhine, and has been employed as such, mixed with any mild vegetable powder.

On the whole, however, Dr. Duncan considers it as a superfluous preparation, whose place may be more securely supplied by other mercurials, or emetics.

SULPHURETUM HYDRARGYRI NIGRUM. *Black Sulphuret of Quicksilver.* Æthiops Mineral.

Take of

Purified quicksilver,
Sublimed sulphur, each equal weights.

Grind them together in a glass mortar, with a glass pestle, till the globules of quicksilver totally disappear.

It is also prepared with twice the quantity of quicksilver.

By this trituration, a chemical combination appears to be effected between the quicksilver and sulphur, and perhaps the metal is at the same time imperfectly oxidated. It is in the form of a very black powder.

The combination is much facilitated by the application of heat, and it can at once be effected by adding the quicksilver to the melted sulphur.

This is, perhaps, the most inactive of the mercurial preparations. It is principally used as an alterative in glandular affections, and in cutaneous diseases. As an anthelmintic, it is sometimes given in a dose of five or ten grains, according to the age. But even in doses of several drachms, continued for a considerable length of time, it has scarcely produced any sensible effect.

SULPHURETUM HYDRARGYRI RUBRUM. *Red Sulphuret of Quicksilver.* Factitious Cinnabar.

Take of

Purified quicksilver, forty ounces,
Sublimed sulphur, eight ounces.

Mix the quicksilver with the melted sulphur, and if the mixture take fire, extinguish it by covering the vessel; afterwards reduce the mass to powder, and sublime it.

In this preparation it was conceived, that, during the inflammation of the materials, the quicksilver was oxidated, and, that therefore the resulting compound was a combination of sulphur and oxide of mercury. The extrication of heat and light, which arises from the mutual action of the ingredients, appears, however, not to be an example of oxygenation, but, to be rather of the same kind, as that which takes place from the combination of

different metals with sulphur; and, according to the analysis of Proust, cinnabar consists of sulphur with metallic mercury, in the proportion of fifteen of the former, to eighty-five of the latter.

Red sulphuret of quicksilver is sometimes used in fumigations, against venereal ulcers in the nose, mouth, and throat. Half a drachm of it burnt, the fume being imbibed with the breath, has occasioned a violent salivation. This effect is by no means owing to the medicine as a sulphuret; for, when set on fire, it is no longer such, but mercury dissolved into vapour, and blended with sulphurous acid gas; in which circumstances, this mineral has a very powerful effect.

Mr. Pearson, from his experiments on mercurial fumigation, concludes, that where checking the progress of the disease suddenly is an object of great moment, and where the body is covered with ulcers, or large and numerous eruptions, and in general, to ulcers, fungi, and excrescences, the vapour of mercury is an application of great efficacy and utility; but, that it is apt to induce a ptyalism rapidly, and great consequent debility; and, that for the purpose of securing the constitution against a relapse, as great a quantity of mercury must be introduced into the system by inunction, as if no fumigation had been employed.

LEAD.

ACETIS PLUMBI. *Acetite of Lead.* Sugar of Lead.

Take of

White oxide of lead, any quantity; put it into a cucurbit, and pour upon it of
Distilled acetous acid, ten times its weight.

Let the mixture stand upon warm sand till the acid become sweet; when it is to be poured off, and fresh acid added until it cease to become sweet. Then evaporate all the liquor, freed from impurities, in a glass vessel, to the consistence of thin honey, and set it aside in a cold place, that the crystals may be formed, which are to be dried in the shade. The remaining liquor is again to be evaporated, that new crystals may be formed; and the evaporation is to be repeated until no more crystals concrete.

The oxide of lead is in this preparation combined with acetous acid; the salt formed concretes in acicular crystals. The process is generally carried on on a large scale, to furnish it for various purposes in the arts.

Like the other preparations of lead, this is a violent poison. It has been used internally however, as a styptic, in profuse menorrhagia, in a dose of half a grain repeated every half hour. But its employment requires much caution. The internal use of acetite of lead, says Dr. Duncan, notwithstanding the encominms some have been rash enough to bestow upon it, is entirely to be rejected. It forms, however, a valuable external application, in superficial and phlegmonic inflammations, bruises, and diseases of the skin. It is always applied in solution, either simply, as to the eyes, or by means of cloths soaked in it, or mixed with bread crumb. A drachm, with five ounces of any distilled water, forms a strong solution, and with ten ounces of water, a weak solution. If common water be used, the addition of about a drachm of acetous acid will be necessary to keep the lead in solution. It is frequently employed as an injection in gonorrhœa, and a collyrium in ophthalmia. Lately, acetite of lead has been exhibited internally with satisfactory success, in obstinate cases of diarrhœa; Dr. John Archer, jun. of Maryland, and some others, speak of it in terms of great praise. Professor Rush has made some successful trials of this medicine in the epilepsy of children, and it has been exhibited with advantage in hysteria and chorea. The dose for adults is from one to three or four grains, and for children, from one quarter to one grain, according to the strength and exigency of the case. [See Med. Repos. vol. 3.]

Aqua Lithargyri Acetati. *Water of Acetated Litharge.* Extract of lead.

Take of

Litharge, one pound.
Strong vinegar, two pints.

Put them together into a glazed earthen pipkin, and let them boil, or rather simmer, for an hour, or an hour and a quarter, taking care to stir them all the while, with a wooden spatula. After the whole has stood to settle, pour off the liquor, which is upon the top, into bottles for use.

This is the original preparation of Goulard, a French surgeon, who many years since introduced it into practice under the name of *extract of saturn*: one hundred drops of which, with four tea spoonfuls of brandy, mixed with a quart of water, form his famous *vegeto-mineral water*. The proportion of the extract may be increased or diminished according to the nature of the disorder, or the greater or less degree of sensibility of the part affected. In his treatise on the virtues of lead, the author has bestowed on this preparation high commendation, as a remedy in various external diseases, such as inflammations, burns, bruises, strains, and ulcers. He likewise prepares with his extract, a number of other compositions, as cataplasms, plasters, ointments, cerates, &c. which he affirms are happily adapted to the indications, in phlegmon, scirrhous and indolent tumors, and in anchylosis, and other rigid states of the joints and tendons. Every purpose, however, to be answered by these, may probably be obtained from the employment of the other preparations of lead in common use. Goulard's extract may be considered as analogous to a solution of acetite of lead in water, with an excess of acid, and must be always variable in strength. It is applied to the same external purposes as the acetite of lead, but from long experience we are disposed to admit its superior utility in many particulars.

ZINC.

OXIDUM ZINCI. *Oxide of Zinc.* Flowers of Zinc.

Let a large crucible be placed in a furnace filled with live coals, so as to be somewhat inclined towards its mouth; and when the bottom of the crucible is moderately red, throw into it a small piece of zinc, about the weight of a drachm. The zinc soon inflames, and it is at the same time converted into white flakes, which are from time to time to be removed from the surface of the metal with an iron spatula, that the combustion may be more complete; and at last, when the zinc ceases to flame, the oxide of zinc is to be taken out of the crucible. Having put in another piece of zinc, the operation is to be repeated, and may be repeated as often as is necessary. Lastly, the oxide of zinc is to be prepared in the same way as the carbonate of lime.

Zinc is the most inflammable of the metals. At the temperature of ignition, it attracts the oxygen of the atmospheric air, and burns vividly. The product is a white oxide, insipid, insoluble, and infusible.

White oxide of zinc is applied externally, as a detergent, and exsiccant remedy. With twice its weight of axunge, it forms an excellent application to deep chops, or excoriated nipples. But, besides being applied externally, it has also of late been used internally. In doses from one, to seven or eight grains, it has been much celebrated in the cure of epilepsy, and several spasmodic affections; and their are sufficient testimonies of their good effects, where tonic remedies in those cases are proper.

CARBONAS ZINCI IMPURUS PRÆPARATUS. *Prepared Impure Carbonate of Zinc.* Prepared Calamine.

The impure carbonate of zinc, after being roasted by those who make brass, is prepared in the same way as carbonate of lime.

Calamine is an ore of zinc, in which, sometimes the metal is merely oxidated, and in other varieties combined with carbonic acid. It is used as an application to superficial inflammation, dusted on the part, and as the basis of the common healing cerate. For these purposes, it ought to be very finely levigated.

OXIDUM ZINCI IMPURUM PRÆPARATUM. *Prepared Impure Oxide of Zinc.* Prepared Tutty.

This is prepared in the same manner as carbonate of lime.

Tutty is a substance of which the origin is doubtful, but it appears to be artificial, and to consist chiefly of oxide of zinc with argillaceous earth. It is used externally for the same purposes as calamine; and hence requires to be very finely levigated.

SULPHAS ZINCI. *Sulphate of Zinc.* White Vitriol.

Take of

Zinc, cut into small pieces, three ounces,
Sulphuric acid, five ounces,
Water, twenty ounces.

Mix them, and when the effervescence is finished, digest the mixture for a little while on hot sand; then strain the decanted liquor through paper, and after proper evaporation, set it apart, that it may crystalize.

The sulphuric acid, by a disposing affinity, enables the zinc to oxidate itself by decomposing the water, and then combines with the oxide. The salt is obtained in acicular crystals. The process, however, is scarcely ever performed in the shops, the sulphate of zinc being prepared on a large scale, from certain varieties of the native sulphuret of the metal. As the crystalization of it is difficult, it is always in the form of hard white masses. The London Pharmacopœia orders this salt to be purified, by dissolving it in water, adding a small portion of sulphuric acid, and crystalizing.

Sulphate of zinc in doses of from ten grains to half a drachm, operates almost instantly as an emetic, and is at the same time perfectly safe. It is therefore given, when immediate vomiting is required, as in cases when poison has been swallowed. By administering it internally, in small doses, it acts as a good tonic, and some physicians in the southern states employ it to cure intermittent fevers, which it frequently does even after the bark has been given without success. Dose for adults from two to five grains, for children in proportion. Dr. Mosely, of Jamaica, states that, in chronic dysentery unattended with fever, there is not a more efficacious remedy than the following solution, taken every morning, and an opiate at bed time. Take sulphate of zinc three drachms, alumen two drachms, spirit lavender half an ounce, boiling water one pint. Dose for adult from four to six drachms, on an empty stomach without diluting it, in some cases to be repeated every six hours. When evacuations are required, the quantity of alum may be diminished, or entirely omitted; and when astringency is required, the alum increased, and the sulphate of zinc diminished. Externally this medicine is used as a styptic application to stop hæmorrhages, diminish increased discharges, as gonorrhœa; and to cure the external inflammations arising from debility and relaxation of the blood vessels, as in some cases of ophthalmia.

Externally, this medicine is used as a styptic application to stop hæmorrhages and diminish increased discharges; two grains being dissolved in an ounce of water is in common use as an injection in gonorrhœa, when the

inflammatory state has subsided, and in gleet. A solution of nearly the same strength is likewise used as a collyrium in ophthalmia, the astringent power of this being increased by the addition of a few drops of sulphuric acid. Dissolved with alum it forms a very styptic liquor, which has long been in use for stopping hæmorrhage and checking increased discharges by external application.

Solutio Acetitis Zinci. *Solution of Acetite of Zinc.*

Take of

Sulphate of zinc, a drachm,
Distilled water, ten ounces.

Dissolve.

Take of

Acetite of lead, four scruples,
Distilled water, ten ounces.

Dissolve.

Mix the solutions; let them stand at rest a little, and then filter the liquor.

The sulphuric acid of the sulphate of zinc, is attracted by the oxide of lead; the acetous acid of the acetite of lead, by the oxide of zinc; the sulphate of lead, being insoluble, is precipitated; the acetite of zinc remains in solution.

This solution is used as an injection in gonorrhœa; it is considered as more astringent than the acetite of lead, and less irritating than the sulphate of zinc.

Liquor Arsenicalis. *Arsenical Solution.* (Lond. Pharm.)

Take of

Prepared oxide of arsenic, in very fine powder,
Subcarbonate of potass from tartar, of each sixty-four grains.
Distilled water, a pint.

Boil them together in a glass vessel until the arsenic be entirely dissolved. When the solution is cold, add compound spirit of lavender four fluidrachms: then add as much distilled water as may be necessary to make up the measure of a pint.

By combination with potass arsenic is rendered soluble in water; and to render the solution of it more perfect, and obtain it in a form in which its dose can be easily regulated, is the object of the present process.—The formula was introduced by Dr. Fowler, as giving a substitute for the arsenical preparation known under the name of Tasteless Ague Drop. Each ounce of the solution contains four grains of the oxide. The dose of this solution should be accurately regulated as follows: From two years old to four, two drops, or three to five; from five to seven, five to seven drops; from eight to twelve, seven to ten drops; from thirteen to eighteen, ten to twelve drops, and the same to adults. These doses may be repeated once in eight or twelve hours, diluted with gruel or barley water. The spirit of lavender is added merely to communicate colour and flavour.

The particular diseases in which arsenic has been found useful as a remedy, have been enumerated under its medical history, in the Materia Medica.

CHAPTER IV.

ETHER, AND ETHERIAL SPIRITS.

ÆTHER SULPHURICUS. *Sulphuric Ether.* Vitriolic Ether.

Take of

Sulphuric acid,
Alcohol, each thirty-two ounces.

Pour the alcohol into a glass retort fit for sustaining a sudden heat, and add to it the acid in an uninterrupted stream.

Mix them by degrees, shaking them moderately and frequently: this done, instantly distill from sand previously heated for the purpose, into a receiver kept cool with water or snow. But the heat is to be so managed, that the liquor shall boil as soon as possible, and continue to boil till sixteen ounces be drawn off: then let the retort be removed from the sand.

To the distilled liquor add two drachms of potass; then distill from a very high retort, with a very gentle heat, into a cool receiver, until ten ounces have been drawn off. If sixteen ounces of alcohol be poured upon the acid remaining in the retort after the first distillation, and the distillation be repeated, more ether will be obtained, and this may be repeated several times.

In the formation of sulphuric ether, it is found by experiment, that the alcohol suffers decomposition; a portion of its carbon is separated in a sensible form, and renders the residual liquor thick and dark coloured; a quantity of water is formed, and the remaining elements of the alcohol unite to form the ether. Ether differs from alcohol in containing less carbon, or rather more hydrogen; and this difference is established, not only by the facts with regard to its formation, but likewise by the comparative products of their combination. With regard to the agency of the sulphuric acid, by which these changes are effected in the composition of the alcohol, two opinions are at present maintained by chemists. According to the older doctrine, part of the sulphuric acid is decomposed; its oxygen combines with a portion

of the hydrogen of the alcohol, and forms water; the balance of attractions among the elements of the alcohol being broken, carbon is deposited, and ether formed from a new combination of these remaining elements.

The ether obtained by the first distillation is impure. It is diluted with water and alcohol, and impregnated generally with sulphurous acid. It is rectified, according to the directions in the Pharmacopœia, by distilling it a second time with a very gentle heat, with the addition of potass, which attracts the sulphurous acid; or, what succeeds better, with the addition of black oxide of manganese, which converts that acid into sulphuric.

Ether properly prepared, has a penetrating diffusive odour, and a very pungent taste. It is highly volatile, evaporating rapidly at the common temperature of the atmosphere. It is soluble in ten parts of water, and combines with alcohol in every proportion. The different ethers, as produced by the different acids, vary in their composition and proportions. They are the lightest and most volatile of all known fluids, and are highly inflammable; their smell is fragrant, and taste hot and pungent.

In their medicinal powers, the ethers resemble alcohol; but they are rather less permanent in their action.

Sulphuric ether, or that obtained from the action of sulphuric acid on alcohol, is principally used. As a medicine taken internally, it is an excellent antispasmodic, cordial, and stimulant. It has been used in cases of rheumatism, gout, and hooping-cough, with great success. In a paroxysm of suffocating asthma, and all those diseases where the organs of respiration are affected, half a tea spoonful of ether in a table spoonful of water, quickly swallowed and occasionally repeated, has often produced instant relief. Even the simple evaporation of this volatile fluid, a spoonful of which may be placed at a time in a shallow vessel contiguous to the patient, has frequently been found of service, and alleviated the most distressing shortness of breath. Or in catarrhal and asthmatic complaints, its vapour may be inhaled with advantage, by holding in the mouth a piece of sugar, on which ether has been dropped. It is given as a cordial in nausea, and in febrile diseases of the typhoid type; as an antispasmodic in hysteria, and in other spasmodic and painful diseases; as a stimulus in soporose and apoplectic affections; and to mitigate the unpleasant sensation

of sea sickness: regular practitioners seldom give so much as half an ounce, much more frequently only a few drops for a dose; but empirics have sometimes ventured upon much larger quantities, and with incredible benefit. When applied externally, it is capable of producing two very opposite effects, according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied closely with the hand, it proves a powerful stimulant and rubefacient, and excites a sensation of burning heat. In this way it is frequently used for removing pains in the head, and Dr. Conyers declares, that a tea spoonful applied to the affected jaw, and repeated till the pain cease, is a never failing remedy for the toothach. But, if it be dropped on any part of the body, exposed freely to the contact of the air, its rapid evaporation produces an intense degree of cold; and as this is attended with a proportional diminution of bulk in the part, applied in this way it has frequently facilitated the reduction of strangulated hernia. The great utility of ether in effecting this last purpose, has been confirmed by recent experience. To mitigate sea sickness, put a tea spoonful of sulphuric ether to a wine glass full of water with some refined sugar previously dissolved in a phial, let the ether be put in quickly and shake them well together. Take this for a dose, and repeat it as occasion may require, but not oftener than every four hours.

ÆTHER SULPHURICUS CUM ALCOHOLE. *Sulphuric Ether with Alcohol.* Dulcified Spirit of Vitriol.

Take of

Sulphuric ether, one part,
Alcohol, two parts.

Mix them.

By this dilution of ether with alcohol, little is gained, except that it is more soluble in water. It was formerly known by the name of spirit of vitriolic ether. The London College apply that name to ether obtained by the first distillation, and unrectified. But this, and some other similar preparations directed by that College, may be regarded as superfluous.

Spiritus Ætheris Nitrosi. *Spirit of Nitrous Ether.* Dulcified Spirit of Nitre.

Take of

Alcohol, three pounds,
Nitrous acid, one pound.

Pour the alcohol into a capacious phial, placed in a vessel full of cold water, and add the acid by degrees, constantly agitating them. Let the phial be slightly covered, and placed for seven days in a cool place; then distill the liquor with the heat of boiling water into a receiver kept cool with water or snow, as long as any spirit comes over.

This is a solution of nitrous ether in alcohol. To prepare pure nitrous ether is difficult, and not without danger, from the violent chemical action which takes place when so much nitrous acid is added as is necessary to convert the whole alcohol into ether. This pharmaceutic preparation, therefore, has been prefered, and, as a medicine, answers perhaps all the purposes which could be derived from the ether. Even it requires caution in its preparation.

The theory of the action of acids on alcohol, and of the formation of ethers, is, notwithstanding modern researches, obscure; and that of nitrous ether is very imperfectly elucidated. It is ascertained, however, that during its production, portions of oxalic and acetous acids are formed; and the experiments of Bayen have clearly proved, that a very considerable portion of the nitric acid is decomposed or combined in such a manner with the principles of the alcohol, that it is no longer capable of saturating an alkali. Perhaps it may be infered, that the acid, by parting with oxygen to the elements of the alcohol, causes the formation of the oxalic and acetous acids, and that the remaining elements of the alcohol unite to form the ether. It appears to contain more carbon than sulphuric ether.

The spirit of nitrous ether always contains a very sensible portion of acid, from which it may be freed by a second distillation, with the addition of magnesia or potass. But on this acid, perhaps, some of its virtues depend.

Its odour is extremely fragrant, its taste pungent and acidulous; it is very volatile and inflammable; soluble in alcohol and water.

Dulcified spirit of nitre has been long deservedly held in great esteem. It quenches thirst, promotes the natural secretions, expels flatulences, and moderately strengthens the stomach. It may be given in doses of from twenty drops to a drachm, in any convenient vehicle. Mixed with a small quantity of spiritus ammoniæ aromaticus, it proves a mild, yet efficacious diaphoretic, and often remarkably diuretic; especially in some febrile cases, where such a salutary evacuation is wanted. It is employed as a refrigerant and diuretic, sometimes as an antispasmodic. Dulcified spirit of nitre given to the extent of half an ounce, combined with one drachm of liquid laudanum, and repeated every half hour has been found remarkably efficacious in the removal of strangury from what ever cause it may arise. A small proportion of this spirit added to malt spirits, gives them a flavour approaching to that of French brandy.

CHAPTER V.

EXPRESSED AND INSPISSATED JUICES.

Vegetable juices are obtained by expression. They consist of various proximate principles of the plant, particularly of mucilage, extractive matter, tannin, fecula, and some saline substances dissolved or suspended in water, and when recent, may possess the medicinal virtues which belong to any of these principles. It is impossible, however, to preserve vegetable matter in solution in water for any length of time without suffering decomposition, and hence juices are unfit for officinal preparations. Where the virtues of any vegetable reside in a principle which is contained in the juice obtained from it by expression, and where this principle is at the same time not volatile, inspissation by a moderate heat will contribute to its preservation, as the soft mass obtained by this process is much less liable to chemical changes than when the re-action of its constituent parts is favoured by dilution with water. The preparation, however, is still liable to disadvantages. By the heat employed in the inspissation, part of its active matter is generally dissipated; and another source of injury is derived from the oxygenation which the extract is liable to suffer when thus heated in contact with the atmospheric air; and the preparation itself being still soft and humid, must gradually undergo chemical alterations. Hence, inspissated juices are generally variable in their medicinal qualities.

Succus Spissatus Aconiti Napelli. *Inspissated juice of Aconite, or Wolfsbane.*

The fresh leaves of the aconite are to be bruised, and being enclosed in an hempen bag are to be pressed strongly, that they may give out their juice, which is to be reduced by evaporation in open vessels heated by boiling

water saturated with muriate of soda to the consistence of thick honey. The mass, after it has cooled, is to be kept in glazed earthen vessels, and moistened with alcohol. This inspissated juice is the form under which wolfsbane was introduced into practice by Storck. He recommended it in glandular swellings, scrofulous and venereal affections, gout, and in obstinate chronic rheumatism, in a dose of half a grain night and morning, and gradually increased to five or six grains. In modern practice it is very seldom prescribed.

In the same manner are prepared the following inspissated juices from the leaves of their respective plants.

Succus Spissatas Atropæ Belladonnæ. *Inspissated Juice of Deadly Nightshade.*

The inspissated juice of Belladonna has been recommended by the German physicians in schirrus, cancer, epilepsy, mania, and hydrophobia, in a dose of one grain, and gradually increased. It retains the peculiar property of the plant, that of occasioning dilatation of the pupil, whence it has also been prescribed in amaurosis.

Succus Spissatus Conii Maculati. *Inspissated Juice of Hemlock.*

Under this form, hemlock was employed by Storck in schirrus and cancer. The dose is at first two grains, but it requires to be quickly increased, and it has at length been taken to the extent of several drachms in the day.

It has already been observed of this plant in the Materia Medica, that in various spasmodic affections, and in phthisis pulmonalis, its great utility has often been demonstrated.

In this preparation of it, the narcotic power of the plant seems always to be more or less impaired; it is also injured by keeping, and we have no other test of its activity than the strength of its narcotic odour. It is therefore inferior to the dried leaves of the plant, which are likewise, however, liable to a considerable degree of uncertainty, according to the manner in which they have been dried and preserved. A common form of exhibition is that of the inspissated juice made into pills by the addition of a sufficient quantity of the powder of the leaves; but on the whole, the powder alone is to be prefered,

both as being in general more active and uniform, and as we have a test of its proper preparation more certain in the richness of its green colour.

Cicuta combined with mercury as in the following form is reported as having proved remarkably successful in the cure of croup.

Take of

Extract cicuta, two drachms,
Quicksilver, half a drachm,
Honey, one ounce,
Mint water, six ounces.

First rub the extract and quicksilver together till the globules disappear, then mix the honey and water. Add to it a spoonful of spirit to preserve it from moulding. Shake the phial, and give a desert spoonful every four, six, or eight hours, according to the urgency of the case and age of the patient.

Succus Spissatus Hyoscyamus Nigri. *Inspissated Juice of black Henbane.*

This inspissated juice retains a considerable degree of narcotic power, and the plant resembling opium in its operation, it is occasionally employed as a substitute for it. The dose has been usually one grain, which requires to be increased; two grains are perhaps not more than equivalent to one grain of opium. The tincture has been introduced as a more certain preparation.

Succus Spissatus Daturæ Stramonii. *Inspissated Juice of Thorn Apple.*

The inspissated juice of the leaves is the form in which Storck, and other German physicians usually employed the stramonium in maniacal, and in epileptic affections, but of late the saturated tincture is prefered, though an extract made by evaporating a decoction of the leaves, or the leaves themselves in powder, will be found equally convenient and useful. Stramonium is known to be of great importance, and its use is extended to various indications in medicine, as will be seen under that head in the Materia Medica part of this volume. The dose of the extract or inspissated juice is from one to ten grains.

Pulparum Extractio. *The Extraction of Pulps.*

Boil unripe pulpy fruits, and ripe ones, if they be dry, in a small quantity of water, until they become soft; then press out the pulp through a hair sieve, and afterwards boil it down to the consistence of honey in an earthen vessel, in a water bath, stirring the matter continually, that it may not burn.

The pulp of cassia fistularis is in like manner to be boiled out from the bruised pod, and reduced afterwards to a proper consistence, by evaporating the water.

The pulps of fruits that are both ripe and fresh, are to be pressed out through the sieve, without any previous boiling.

CHAPTER VI.

FIXED OILS, AND OILY PREPARATIONS.

The chemical properties of these oils have already been described. They exist unmixed in the fruit and seeds of vegetables, and are obtained by expression, or decoction with water. The former is in general to be prefered; and to afford the oil pure it must be performed without heat, which, though it favours the separation of the oil, communicates to it an unpleasant flavour. To preserve them from becoming rancid, they ought to be kept secluded from the air.

A process in Pharmacy somewhat difficult is to mix these oils with any watery fluid, so that they may be conveniently exhibited. It is usually done by the medium of mucilage, or of an alkali. If triturated with mucilage, and a small quantity of sugar, the oil is diffused through the water, and a milky liquor formed. A combination still more permanent is effected, by adding a few drops of water of ammonia, or two or three grains of carbonate of potass.

Oleum Amygdali Communis. *Oil of Almonds.*

Take of

Fresh sweet almonds, any quantity.

After having bruised them in a stone mortar, put them into a hempen bag, and express the oil without heat.

The oil thus obtained is the purest of the expressed oils, being entirely free from odour or taste, and is used for the general purposes of expressed oils.

In the same manner is to be expressed from its seeds,

Oleum Lini Usitatissimi. *Oil of Linseed.*

From the seeds of the plant. Being rather less pure, it is used only as an external application.

For the preparation of *oleum ricini*, and *oleum olivarum*. [See those articles in the Materia Medica.]

OLEUM AMMONIATUM. *Ammoniated Oil.* Volatile Liniment.

Take of

Olive oil, two ounces,
Water of ammonia, two drachms.

Mix them together.

The above preparation may be made with three or four times the quantity of water of ammonia.

This preparation is very frequently used externally as a stimulant and rubefacient. Dr. Pringle observes, that in inflammatory sore throats, a piece of flannel moistened with this liniment, applied to the throat, and renewed every four or five hours, is one of the most efficacious remedies. By means of this warm stimulating application, the neck, and sometimes the whole body, is put into a sweat, which after bleeding either carries off, or lessens the inflammation. When too strong, or too liberally applied, it sometimes occasions inflammations, and even blisters. Where the skin cannot bear the acrimony, a larger proportion of the oil may be used.

OLEUM LINI CUM CALCE. *Linseed Oil with Lime.*

Take of

Linseed oil,
Lime water, of each equal parts.

Mix them.

This liniment is extremely useful in cases of scalds or burns, being singularly efficacious in preventing, if applied in time, the inflammation subsequent to burns or scalds; or even in removing it, after it has come on.

OLEUM SULPHURATUM. *Sulphurated Oil.* Balsam of Sulphur.

Take of

Olive oil, eight ounces,
Sublimed sulphur, one ounce.

Boil them together in a large iron pot, stirring them continually, till they unite.

Sulphurated oil, formerly balsam of sulphur, has been strongly recommended in coughs, consumptions, and other

disorders of the breast and lungs. But the reputation which it had in these cases, does not appear to have been derived from any fair trial or experience. It is manifestly hot, acrimonious, and irritating; and should therefore be used with the utmost caution. It has frequently been found to injure the appetite, offend the stomach and viscera, parch the body, and occasion thirst and febrile heats. The dose of it is from ten to forty drops.

Oleum Camphoratum. *Camphorated Oil.*

Take of

Olive oil, two ounces,
Camphor, half an ounce.

Mix them so that the camphor may be dissolved.

This is a simple solution of camphor in fixed oil, and is an excellent application to local pains from whatever cause, and to glandular swellings, which are to be rubbed with the application once, twice, or thrice a day, according to circumstances.

CHAPTER VII.

DISTILLED WATERS, AND SPIRITS.

By distillation of water from vegetable substances, it is frequently impregnated with their flavour and taste. This is owing to their essential oil being volatilized at the temperature at which water boils, and being dissolved in small proportion by the water condensed. It is very seldom that any important virtue of vegetables resides in that principle, and hence the different distilled waters are more used as vehicles of other remedies, than as being themselves active medicines. It is evident that it is only those vegetables which contain a sensible quantity of essential oil, that can be subjected with advantage to this process; and that any quality in the other principles of the vegetable will not be obtained in the distilled water. To preserve the distilled waters from decomposition, to which they are liable, from the small quantity of vegetable matter they contain, a proportion of alcohol, about one fiftieth of their weight, may be added to them; and they require to be secluded from the air.

Distilled Spirits are prepared by distilling pure alcohol, or diluted alcohol, from vegetable substances. Alcohol in its pure state, seldom receives any sensible impregnation; because, although it is capable of dissolving the essential oils of plants, there are very few of them which it can bring over in distillation: a higher temperature being necessary to volatilize them than the alcohol. But, by employing diluted alcohol, a liquor is obtained more odorous and pungent. When heated with the vegetable, the alcohol first distills over, and afterwards the water with the essential oil, and the whole, when condensed, forms a transparent fluid. These distilled spirits, like the distilled waters, are in general merely agreeable vehicles for the exhibition of other medicines, or grateful stimulants, sometimes used to relieve nausea and flatulence. The directions for preparing them are given in the Pharmacopœia, under the spirit of Caraway.

Aqua Destillata. *Distilled Water.*

Let water be distilled in very clean vessels, until about two thirds of it have come over.

In nature no water is found perfectly pure. Spring or river water always contains a portion of saline matter, principally sulphate of lime; and, from this impregnation, is unfit for a number of Pharmaceutic preparations. By distillation a perfectly pure water is obtained.

Aqua Citri Aurantii. *Orange Peel Water.*

Take of

Fresh orange peel, two pounds.

Pour upon it as much water as shall be sufficient to prevent any empyreuma, after ten pounds have been drawn off by distillation.

After due maceration, distill ten pounds.

The same quantity of water is to be distilled in the same manner, from

Six pounds of the recent petals of the Damask rose, to prepare *Aqua rosæ damascenæ.* Damask rose water.

Three pounds of Peppermint in flower.....*Aqua menthæ piperitæ.* Peppermint water.

Three pounds of Pennyroyal in flower.....*Aqua menthæ pulegii.* Pennyroyal water.

One pound and a half of Spearmint in flower.....*Aqua menthæ viridis.* Spearmint water.

One pound of The bark of cinnamon.....*Aqua lauri cinnamomi.* Cinnamon water.

One pound of The bark of cassia.....*Aqua lauri cassiæ.* Cassia water.

Half a pound of The fruit of pimento.....*Aqua myrti pimentæ.* Pimento water.

To each pound of these waters add half an ounce of diluted alcohol.

The virtues of all these waters are nearly alike; and the peculiarities of each will be easily understood by consulting the account given in the Materia Medica of the substances from which they are prepared.

SPIRITUS CARI CARUI. *Spirit of Caraway.* Spirituous Caraway Water.

Take of

Caraway seeds bruised, half a pound,
Diluted alcohol, nine pounds.

Macerate two days in a close vessel; then pour on as much water as will prevent empyreuma, and draw off by distillation nine pounds.

In the same manner is prepared the same quantity of spirit from

One pound of *Spiritus*
Bark of cinnamon, bruised.....*Lauri Cinnamomi.*
Spirit of cinnamon.

One pound and a half of
Peppermint in flower.....*Menthæ piperitæ.*
Spirit of peppermint.

One pound and a half of
Spearmint in flower.....*Menthæ viridis.*
Spirit of spearmint.

Two ounces of
Nutmeg, well bruised.....*Myristicæ moschatæ.*
Spirit of nutmeg.

Half a pound of
The fruit of pimento bruised.....*Myrti pimentæ.*
Spirit of pimento, or allspice.

SPIRITUS LAVANDULÆ SPICÆ. *Spirit of Lavender.* Simple Spirit of Lavender.

Take of

Flowering spikes of lavender, fresh gathered, two pounds,
Alcohol, eight pounds.

Draw off by the heat of boiling water, seven pounds.

By these directions, and in the same quantity is prepared,

SPIRITUS ROBISMARINI OFFICINALIS. *Spirit of Rosemary.*

SPIRITUS JUNIPERI COMPOSITUS. *Compound Spirit of Juniper.*

Take of

Juniper berries, well bruised, one pound,
Caraway seeds,
Sweet fennel seeds, each bruised, one ounce and a half,
Diluted alcohol, nine pounds,
Water, sufficient to prevent empyreuma.

Macerate two days, and draw off nine pounds by distillation.

It is unnecessary to make particular observations on each of these simple spirits, as their virtues are the same with those of the substances from which they are extracted, united to the stimulus of the alcohol.

ALCOHOL AMMONIATUM FOETIDUM. *Fetid Ammoniated Alcohol.* Fetid Spirit of Ammonia.

Take of

Ammoniated alcohol, eight ounces,
The gum resin of assa fœtida, half an ounce.

Digest in a close vessel twelve hours; then distill off with the heat of boiling water eight ounces.

This spirit is designed as an anti-hysteric, and is undoubtedly a very elegant one. Volatile spirits, impregnated for these purposes with different fetids, have been usually kept in the shops. The ingredient here chosen, is the best calculated of any for general use, and equivalent in virtue to them all. The spirit is pale when newly distilled, but acquires a considerable tinge by keeping. Its dose is thirty drops.

CHAPTER VIII.

VOLATILE OILS. DISTILLED, OR ESSENTIAL OILS.

Volatile oils are prepared nearly in the same manner as the distilled waters, except that less water is to be added. Seeds and woody substances are to be previously bruised or rasped.

The oil comes over with the water, and is afterwards to be separated from it, according as it may be lighter than the water, and swim upon its surface, or heavier, and sink to the bottom. Besides, in preparing both distilled waters and oils, it is to be observed, that the goodness of the subject, its texture, the season of the year, and similar causes, must give rise to so many differences, that no certain or general rule can be given to suit accurately each example.

Therefore, many things are omitted, to be varied by the operator according to his judgment, and only the most general precepts are given.

Volatile oils, medicinally considered, agree in the general qualities of pungency and heat; in particular virtues, they differ as much as the subjects from which they are obtained, the oil being the direct principle in which the virtues, or at least a considerable part of the virtues of the several subjects reside. Thus the carminative virtue of the warm seeds, the diuretic of juniper berries, the emmenagogue of savin, the nervine of rosemary, the stomachic of mint, the antiscorbutic of scurvy grass, the cordial of aromatics, &c. are supposed to be concentrated in their oils. The more grateful oils are frequently made use of for reconciling to the stomach medicines of themselves disgustful. Volatile oils are never given alone, on account of their extreme heat and pungency; which in some is so great, that a single drop let fall upon the tongue, produces a gangrenous eschar. They are readily imbibed by pure dry sugar, and in this form may be conveniently exhibited. Ground with eight

or ten times their weight of sugar, they become soluble in aqueous liquors, and thus may be diluted to any assigned degree. Mucilages also render them miscible with water into a uniform milky liquor. They dissolve likewise in spirit of wine; the more fragrant in an equal weight, and almost all of them in less than four times their own quantity. These solutions may be either taken on sugar, or mixed with syrup, or the like. On mixing them with water, the liquor grows milky, and the oil separates. The more pungent oils are employed externally against paralytic complaints, numbness, pains, aches, cold tumors, and in other cases where particular parts require to be heated or stimulated. The toothach is sometimes relieved by a drop of these almost caustic oils, received on cotton, and cautiously introduced into the hollow tooth. Volatile oils should be kept in small bottles, closely stopped, in a cool place.

Oleum Juniperi Communis. *Oil of Juniper.*

When genuine, this oil has the flavour of the juniper berries, and is soluble in alcohol. It is stimulating, carminative, diaphoretic, and diuretic in doses of ten or fifteen drops. There is generally substituted for it in the shops an oil distilled from some species of turpentine much less grateful, which alcohol does not dissolve.

Oleum Juniperi Sabinæ. *Oil of Savin.*

This plant yields more essential oil than any other does, two pounds affording not less than five ounces. The virtues of the savin seem also to depend on it, as the essential oil is said to be a powerful emmenagogue, in a dose from three to ten drops. In cold phlegmatic habits, it is undoubtedly a medicine of great service.

Oleum Menthæ Piperitæ. *Oil of Peppermint.*

This is one of the most pungent of the essential oils, diffusing almost as soon as taken a glowing warmth through the whole system, and at the same time exciting a peculiar sensation of coolness. In colics, accompanied with great coldness, and in some hysteric complaints, it is of excellent service. And as a remedy in flatulence,

anorexia, and cramps of the stomach, it has often afforded much relief. Two or three drops are in general a sufficient dose. The preparation named essence of peppermint is a solution of one part of the oil in seven parts of alcohol, and coloured by the addition of grass or garden parsley. This is an agreeable and convenient preparation, and is in common use as a carminative in doses of twenty or thirty drops on sugar or in water.

Oleum Pimpinellæ Anisi. *Oil of Anise.*

This oil is of a light colour, and has rather an unpleasant smell. It congeals even at a very moderately cold temperature. It has less pungency than any of the other essential oils, and is therefore well adapted to the purpose to which it is usually applied, that of relieving flatulence and the symptoms arising from it in children. To one ounce of white sugar candy, or refined sugar, add one hundred drops of the best oil of aniseed; having rubbed them together in a marble mortar, let them be well mixed with one ounce of spermaceti in powder. About twenty grains of this compound given in a little milk every three or four hours will be found extremely beneficial in such cases of convulsions in children, prior to the age of dentition, as proceed from acrid irritating humors in the first passages, and having been preceded by gripings, green stools, flatulence, and pain.

Oleum Lavendulæ Spicæ. *Oil of Lavender.*

This is used principally on account of its fine flavour.

Oleum Carui. *Oil of Caraway.*

This is one of the most grateful of the essential oils, and well adapted to act as a carminative, or to communicate an agreeable pungency, and cover the flavour of unpleasant remedies.

Oleum Rorismarini Officinalis. *Oil of Rosemary.*

It is sometimes used in ointments as a perfume, and it enters as a stimulant into the composition of the soap liniment.

Oleum Myrti Pimentæ. *Oil of Pimento.*

It is sometimes used on account of the flavour of pimento, which it possesses.

Oleum Menthæ Viridis. *Oil of Spearmint.*

The flavour of this oil is similar to that of peppermint, rather less grateful, and not so much esteemed. It is sometimes useful in relieving nausea and vomiting.

Oleum Pulegii. *Oil of Pennyroyal.*

This oil may be regarded as superfluous.

Oleum Fœniculi Dulcis. *Oil of Sweet Fennel.*

The flavour of this oil is similar to that of anise.

Oleum Volatile Pini Purissimum. *Purified Volatile Oil of Pine.* Rectified Oil of Turpentine.

Take of

Oil of turpentine, one pound,
Water, four pounds,

Distill as long as any oil comes over.

The oil of turpentine of commerce is obtained by distillation from what is named common turpentine, the juice of the pinus larix, or sometimes from the wood of the tree. It appears to contain a small portion of resinous matter, as when distilled it leaves a little of a thick residuum, and the distilled oil has been said to be more volatile.

The spirit of turpentine, as this essential oil has been styled, is frequently taken internally as a diuretic and sudorific, and it has sometimes a considerable effect when taken to the extent of a few drops only. It has, however, been given in much larger doses, especially when mixed with honey. Recourse has principally been had to such doses in cases of chronic rheumatism, particularly in those modifications of it which are termed sciatica, and lumbago, but sometimes they induce bloody urine. Ex-

ternally it is applied by friction as a stimulant to parts affected with cramp and rheumatism; sometimes too it is used as an application to burns, or as a styptic to bleeding wounds. Mixed with the Basilicon ointment it forms the celebrated application for burns recommended by Mr. Kentish. This oil has lately been administered by Dr. I. Brown with complete success in the case of a lad aged sixteen years afflicted for six years with tænia. He swallowed it undiluted in a dose of one ounce, and once in a dose of one and half ounce, and took three doses in sixteen hours. It operated powerfully as a cathartic, and he discharged upwards of twenty feet of the tænia. Dr. Brown is convinced that the rectified oil of turpentine may be taken to the extent of two or three ounces with perfect safety, though he prefers half ounce doses at short intervals.

OLEUM SUCCINI PURISSIMUM. *Purified Oil of Amber.*

Distill oil of amber in a glass retort, with six times its quantity of water, till two thirds of the water have passed into the receiver; then separate this very pure volatile oil from the water, and keep it for use in well closed vessels.

The rectified oil has a strong bituminous smell, and a pungent acrid taste. Given in a dose of ten or twelve drops, it heats, stimulates, and promotes the fluid secretions. It is chiefly celebrated in hysterical disorders, and in deficiencies of the uterine purgations. Sometimes it is used externally, in liniments for weak or paralytic limbs and rheumatic pains.

CHAPTER IX.

INFUSIONS AND DECOCTIONS.

Infusion is a term employed in pharmacy, to denote that operation in which water, on remaining for sometime on vegetable matter, dissolves part of it; and also to express the preparation which results from that operation. It is obvious, that infusion, understood in this sense, can be applied with propriety only to those plants whose virtues depend on principles soluble in water. The strength of the infusion is considerably influenced by the temperature of the fluid, hot water dissolving more of the soluble matter than cold; while cold water, from this circumstance, frequently affords a preparation which, if weaker, is more grateful. From dried vegetables, the soluble matter is in general more easily obtained than from those which are recent. Infusions are always extemporaneous preparations, and cannot be preserved in a sound state for more than a few days.

By *boiling* vegetable substances in water, their active matter is more abundantly dissolved than by simple infusion. The preparation thus obtained is termed a *decoction*. In a number of cases, part of the matter dissolved by the assistance of the high temperature separates as the liquor cools, especially where it is of a resinous matter; in others, however, it is retained.

Though a large portion of matter is dissolved by the water in this mode of preparation, yet it cannot be always advantageously employed. Wherever the virtues of the substance subjected to it depend, in whole or in part, on any volatile principle, they are necessarily injured by this being dissipated. At the temperature of 212°, humid extractive matter combines too with oxygen from the atmospheric air; and perhaps at the same temperature, some vegetable principles suffer decomposition from the reaction of their constituent parts: hence many vegetables suffer injury from boiling, even where this cannot be ascribed to the dissipation of their volatile parts. These circumstances limit considerably the application of this form of preparation.

Decoctions are always extemporaneous preparations. In general, during the boiling, the air should be excluded, and the liquor ought to be strained while hot.

Infusum Cinchonæ Officinalis. *Infusion of Cinchona.*

Take of

Bark of cinchona, in coarse powder, one ounce,
Mucilage of gum arabic, two ounces,
Water, one pound.

Triturate the cinchona with the mucilage, and add the water during the trituration. Macerate for twenty-four hours, and decant the pure liquor.

This is a very elegant form of exhibiting the active principles of the Peruvian bark, and that in which it will sit lightest on weak and delicate stomachs. The trituration will promote the solution, and the addition of the mucilage will suspend the finest particles of the substance of the bark itself.

This preparation is used principally in dyspepsia, in a dose of two ounces occasionally.

Infusum Digitalis Purpureæ. *Infusion of Common Foxglove.*

Take of

Dried leaves of common foxglove, one drachm,
Boiling water, eight ounces,
Spirit of cinnamon, one ounce.

Macerate for four hours, and filtrate.

Infusion is the form under which Dr. Withering, who introduced the use of digitalis in dropsy, recommended it to be given. The dose is half an ounce, taken twice a day, and gradually increased till the effects of the remedy appear. The spirit of cinnamon is added to improve its flavour, and to counteract its sedative effects.

Infusum Gentianæ Compositum. *Compound Infusion of Gentian.* Bitter Infusion.

Take of

Root of gentian sliced, half an ounce,
Rind of Seville oranges dried and bruised, one drachm,
Coriander seeds bruised, half a drachm,
Diluted alcohol, four ounces,
Water, one pound.

First pour on the alcohol, and three hours after add the water; then macerate without heat for twelve hours and strain.

This infusion is an extremely good bitter, and is of great service in dyspepsia, and in all cases where bitters in general are necessary. It strengthens the stomach, and increases the appetite; besides acting as a tonic on the other parts of the body, and on the vascular system. The alcohol is a useful addition, both in promoting the extraction of the virtues of all the ingredients, and in preserving the infusion longer from spoiling. Its dose is two ounces occasionally.

Infusum Mimosæ Catechu. *Infusion of Catechu.* Japonic Infusion.

Take of

Extract of catechu in powder, two drachms and a half,
Bark of cinnamon bruised, half a drachm,
Boiling water, seven ounces,
Simple syrup, one ounce.

Macerate the extract and cinnamon in the hot water, in a covered vessel, for two hours; then strain it and add the syrup.

The extract of catechu is completely soluble in water. This preparation, therefore, formerly called Japonic infusion, possesses all its virtues uninjured, and rendered more grateful by the addition of the cinnamon. It is a powerful astringent solution. Its principal use is in diarrhœa. Dose one ounce every third or fourth hour.

INFUSUM RHEI PALMATI. *Infusion of Rhubarb.*

Take of

Root of rhubarb, bruised, half an ounce,
Boiling water, eight ounces,
Spirit of cinnamon, one ounce.

Macerate the rhubarb in a close vessel with the water for twelve hours; then having added the spirit, strain the liquor.

This appears to be one of the best preparations of rhubarb, when designed as a purgative; water extracting its virtue more effectually than either vinous or spirituous menstrua. The infusion of rhubarb is supposed to have more of the purgative than of the astringent power. It is accordingly used as a mild cathartic. Dose two ounces.

INFUSUM ROSÆ GALLICÆ. *Infusion of Roses.* Formerly Tincture of Roses.

Take of

Petals of red roses, dried, two ounces,
Boiling water, five pounds,
Sulphuric acid, one drachm,
Double refined sugar, two ounces.

Macerate the petals with the boiling water in an earthen vessel, which is not glazed with lead, for four hours; then having poured on the acid, strain the liquor and add the sugar.

The rose leaves have very little effect, except in giving the mixture an elegant red colour. Its sub-acid and astringent virtues depend entirely on the sulphuric acid. Altogether, however, it is an elegant medicine, and forms a very grateful addition to juleps in hæmorrhages, and in all cases which require mild coolers and sub-astringents. It is sometimes taken with boluses or electuaries of the bark, and likewise makes a good gargle in cases of cynanche.

INFUSUM TAMARINDI ET SENNÆ. *Infusion of Tamarinds and Senna.*

Take of

Preserved tamarinds, one ounce,
Leaves of senna, one drachm,

Coriander seeds bruised, half a drachm,
Brown sugar, half an ounce,
Boiling water, eight ounces.

Macerate them for four hours, occasionally agitating them in a close earthen vessel, not glazed with lead, and strain the liquor.

It may also be made with double, triple, &c. the quantity of senna.

This combination affords a very pleasant purgative, mild in its operation. The whole quantity may be taken at intervals as a dose. The taste of the senna is well covered by the aromatic. sugar. and by the acidity of the tamarinds. It is excellently suited for delicate stomachs, and inflammatory diseases. Ginger may be used instead of coriander seeds.

Decoctum Althææ Officinalis. *Decoction of Marsh-Mallow.*

Take of

Root of marsh-mallow, dried and bruised, four ounces,
Raisins stoned, two ounces,
Water, seven pounds.

Boil to five pounds; place apart the strained liquor till the feces have subsided, then pour off the clear liquor.

Marsh-mallow roots contain nothing soluble in water, except mucilage, which is very abundant in them. This decoction is therefore to be considered merely as an emollient, rendered more pleasant by the acidulous sweetness of the raisins.

Decoctum Cinchonæ Officinalis. *Decoction of Cinchona.*

Take of

Bark of cinchona in powder, one ounce,
Water, a pound and a half.

Boil for ten minutes in a covered vessel, and strain the liquor while hot.

Peruvian bark readily yields its active principles to the action of boiling water, and in greater quantity than cold water is capable of retaining dissolved; therefore, when a saturated decoction cools, it becomes turbid, and

there is always a deposition of a yellowish or reddish powder, while the supernatant liquor is reduced to the strength of a saturated cold infusion. Decoction, therefore, presents us with an easy means of obtaining immediately an active preparation of cinchona bark, and one of greater strength than a cold or even a warm infusion, provided it be drunk while tepid, and before it forms any deposition, or if the precipitate be diffused by agitation, after it is formed.

Formerly it was supposed that the strength of a decoction of cinchona bark, and similar substances, was increased by continuing the boiling for a great length of time, but this is now known to be a mistake; and, indeed, after a certain time, the decoction becomes weaker instead of stronger, because water at different temperatures is capable of dissolving only a determinate proportion of their active principles; and, therefore, as soon as it is saturated, any further decoction is unnecessary. But moreover, these principles, when dissolved in water, are liable to be decomposed and become inert, by the absorption of atmospheric oxygen, and their decomposition is increased by increase of temperature; and as boiling constantly presents new surfaces to the action of the air, it is evidently hurtful when protracted longer than what is just necessary to saturate the water. Ten minutes is supposed by the colleges to be sufficient for that purpose. This decoction is given in general when bark in considerable doses is requisite, and where the powder does not remain on the stomach. The dose is two ounces repeated occasionally.

Decoctum Daphnes Mezerei. *Decoction of Mezereon.*

Take of

Bark of the root of mezereon, two drachms.
Root of liquorice bruised, half an ounce,
Water, three pounds.

Boil with a gentle heat to two pounds, and strain.

The use of the liquorice is to cover the pungency of the mezereon. The decoction is given in a dose of six or eight ounces, three or four times a day, in the cases in which mezereon is employed, principally in the secondary symptoms of syphilis, and in rheumatic affections. It operates chiefly by perspiration.

Decoctum Guaiaci Compositum. *Compound Decoction of Guaiacum.* Decoction of the Woods.

Take of

Raspings of the wood of guaiacum, three ounces,
Raisins, two ounces,
Root of sassafras sliced,
Root of Liquorice bruised, each one ounce,
Water, ten pounds.

Boil the guaiacum and raisins with the water, over a gentle fire, to the consumption of one half; adding towards the end the sassafras and liquorice. Strain the liquor without expression.

This decoction is of use in some rheumatic and cutaneous affections. It may be taken by itself, to the quantity of a quarter of a pint, two or three times a day, or used as an assistant in a course of mercurial or antimonial alteratives; the patient, in either case, keeping warm, in order to promote the operation of the medicine.

Decoctum Hordei Distichi. *Decoction of Barley.*

Take of

Pearl barley, two ounces,
Water, five pounds.

First wash the barley from the mealy matter that adheres to it, with some cold water; then boil it a little with about half a pound of water, to extract the colouring matter. Throw this away, and put the barley thus purified into five pounds of boiling water; which is to be boiled down to one half, and strained.

This decoction is to be used freely, as a diluting drink in febrile and other acute disorders. However trivial medicines of this class may appear to be, they are of greater importance in the cure of acute diseases than many more elaborate preparations.

Decoctum Polygalæ Senegæ. *Decoction of Seneka.*

Take of

Root of seneka, one ounce,
Water, two pounds.

Boil to sixteen ounces and strain.

The virtues of this decoction will be easily understood from those of the root from which it is prepared. The dose in hydropic cases, and rheumatic or arthritic complaints, is two ounces, three or four times a day, according to its effect. It is given also as an expectorant in pneumonia, and as a stimulant in croup.

Decoctum Smilacis Sarsaparillæ. *Decoction of Sarsaparilla.*

Take of

Root of sarsaparilla sliced, six ounces,
Water, eight pounds.

Macerate for two hours with a heat of about 195° ; then take out the root and bruise it ; return the bruised root to the liquor, and again macerate it for two hours. Then the liquor, being boiled to the measure of four pints, press it out and strain.

Under this form sarsaparilla has been given in the secondary symptoms of syphilis. It is indeed a very doubtful remedy, and its diaphoretic effects are probably owing to its being drunk warm. It is totally incapable of curing syphilis ; but by some it is thought useful in the sequelæ of that disease.

CHAPTER X.

EMULSIONS AND MUCILAGES.

Emulsions are preparations in which the expressed oil of seeds or kernels is suspended in water by the medium of the mucilage, and perhaps also of the fecula which the seeds contain. They are always opaque and milky: as the oil is merely diffused through the water, it gradually collects and rises to the surface; and owing to the vegetable matter dissolved in the liquor, they are also liable to become sour. They likewise suffer decomposition from vinous spirits or acids.

Emulsio Amygdali Communis. *Emulsion of Almonds.* Almond Milk.

Take of

Sweet almonds blanched, one ounce,
Water, two pounds and a half.

Beat the almonds very thoroughly in a stone mortar, gradually pouring on them the water; then strain off the liquor.

This is used merely as a demulcent in catarrh and gonorrhœa, or to obviate strangury during the application of a blister, being drunk *ad libitum*.

Emulsio Camphorata. *Emulsion of Camphor.*

Take of

Camphor, one scruple,
Sweet almonds blanched, two drachms,
Double refined sugar, one drachm,
Water, six ounces.

This is to be made in the same manner as the almond emulsion.

Camphor is less apt to induce nausea when given in liquid than when in a solid form; and this is one of the best forms of preparation. Its dose is two ounces.

EMULSIO AMMONIACI. *Emulsion of Ammoniacum.*

Ammoniacum Milk.

Take of

Ammoniacum, two drachms,
Water, eight ounces.

Rub the gum resin with the water, gradually poured on, until it become an emulsion.

In this mixture the resin and oily matter are suspended in the water by the medium of the gum, and a milky like fluid formed, from which the resin gradually subsides. It is given as an expectorant, in a dose from half an ounce to an ounce at a time.

MISTURA CARBONATIS CALCIS. *Mixture of Carbonate of Lime.* Chalk Mixture.

Take of

Prepared carbonate of lime, one ounce,
Double refined sugar, half an ounce,
Mucilage of gum arabic, two ounces.

Triturate together, and then gradually add of

Water, two pounds and a half,
Spirit of cinnamon, two ounces.

Mix them.

This is a very elegant form of exhibiting chalk, and is an useful remedy in diseases arising from, or accompanied with acidity in the primæ viæ. It is frequently employed in diarrhœa proceeding from that cause. The mucilage not only serves to keep the chalk uniformly diffused, but also improves its virtues. The dose of this medicine requires no nicety. It may be taken to the extent of a pound or two in the course of a day.

MUCILAGO AMYLI. *Mucilage of Starch.*

Take of

Starch, half an ounce.
Water, one pound.

Triturate the starch, gradually adding the water; then boil them a little.

The mucilage thus formed is very useful in those cases where a glutinous substance is required. It is often successfully employed with opium, as a clyster, in diarrhœa depending on acrimony in the intestines.

Mucilago Astragali Tragacanthæ. *Mucilage of Gum Tragacanth.*

Take of

Gum tragacanth in powder, one ounce,
Boiling water, eight ounces.

Macerate twenty-four hours; then triturate them carefully, that the gum may be dissolved, and press the mucilage through linen cloth.

Gum tragacanth is difficultly soluble in water. When macerated in it, it swells, but does not dissolve. To effect the solution it must be beaten into a paste with some of the water; and the rest of the water must be added gradually, and incorporated with the paste by beating them together. It is used principally in making troches.

Mucilago Mimosæ Niloticæ. *Mucilage of Gum Arabic.*

Take of

Gum arabic in powder, one part,
Boiling water, two parts.

Digest with frequent agitation, until the gum be dissolved; then press the mucilage through linen.

This is the mucilage that is usually employed for pharmaceutic purposes; such as suspending substances insoluble in water, rendering oils miscible with watery liquors, &c. It is also much used for properties peculiar to these substances of its own class, and of all the gums this seems to be the purest.

CHAPTER XI.

SYRUPS.

Syrups are solutions of sugar in water, either pure, or containing other substances dissolved. They are seldom active medicines, but are principally designed to render others pleasant. The proportion of sugar with which they are generally made, is about two parts to one of fluid.

Syrupus Simplex. *Simple Syrup.*

Take of

Double refined sugar, fifteen parts,
Water, eight parts.

Let the sugar be dissolved in the water by a gentle heat, and boiled a little, so as to form a syrup.

This solution of sugar is used merely to communicate sweetness of taste. It is more convenient in extemporaneous prescription than sugar undissolved.

Syrupus Althææ Officinalis. *Syrup of Marsh-Mallow.*

Take of

Fresh roots of marsh-mallow sliced, one pound,
Water, ten pounds,
Double refined sugar, four pounds.

Boil the water with the roots to the consumption of one half, and strain the liquor, strongly expressing it. Suffer the strained liquor to rest till the feces have subsided; and to the depurated liquor add the sugar; then boil so as to make a syrup.

This is merely a mucilaginous syrup, and is chiefly used in nephritic cases for sweetening emollient decoctions, and in coughs produced by irritation.

Syrupus Amomi Zingiberis. *Syrup of Ginger.*

Take of

Roots of ginger bruised, three ounces,
Boiling water, four pounds,
Double refined sugar, seven pounds and a half.

Macerate the ginger in the water in a close vessel, for twenty-four hours; then to the liquor strained, add the sugar in powder, so as to make a syrup.

This is an agreeable and moderately aromatic syrup, impregnated with the flavour and virtues of the ginger.

Syrupus Citri Aurantii. *Syrup of Orange Peel.*

Take of

The fresh outer rind of Seville oranges, six ounces,
Boiling water, three pounds,
Double refined sugar, four pounds.

Macerate the rind in the water for twelve hours; then add to the filtrated liquor the sugar in powder, and apply a gentle heat, so as to form a syrup.

This syrup is a very elegant and agreeable one, possessing a great share of the fine flavour of the orange peel.

Syrupus Citri Medicæ. *Syrup of Lemons.* Syrup of Lemon Juice.

Take of

Juice of lemons, suffered to stand till the feces have subsided, and afterwards strained, three parts,
Double refined sugar, five parts.

Dissolve the sugar in the juice, so as to make a syrup.

This pleasant syrup is used to sweeten and acidulate mixtures, especially those of the mucilaginous kind.

Syrupus Papaveris Somniferi. *Syrup of White Poppies.* Diacodium.

Take of

Capsules of white poppy dried, and freed from the seeds, two pounds,

Boiling water, thirty pounds,
Double refined sugar, four pounds.

Macerate the sliced capsules in the water for twelve hours; next boil till only one third part of the liquor remain; then strain it by expressing it strongly. Boil the strained liquor to the consumption of one half, and strain again. Lastly, add the sugar, and boil a little, so as to form a syrup.

This syrup, impregnated with the opiate matter of the poppy heads, is given to children in doses of two or three drachms, to adults, from half an ounce to an ounce, for easing pain, procuring rest, and answering the other intentions of mild opiates. It is uncertain in its strength.

SYRUPUS RHAMNI CATHARTICI. *Syrup of Buckthorn.*

Take of

Juice of ripe buckthorn berries depurated, two parts,
Double refined sugar, one part.

Boil them so as to form a syrup.

This preparation, in doses of three or four spoonfuls, operates as a brisk cathartic. The principal inconveniences attending it are, being very unpleasant, and occasioning a thirst and dryness of the mouth and fauces, and sometimes violent gripes: these effects may be prevented by drinking liberally of water gruel, or other warm liquors, during the operation.

SYRUPUS ROSÆ DAMASCENÆ. *Syrup of Damask Roses.*

Take of

Fresh petals of the damask rose, one pound,
Boiling water, four pounds,
Double refined sugar, three pounds.

Macerate the roses in the water for a night; then to the liquor strained and freed from the dregs, add the sugar; boil them into a syrup.

This syrup is a very mild purgative, and as such, is given to children in a dose of two or three tea spoonfuls.

Syrupus Rosæ Gallicæ. *Syrup of Red Roses.*

Take of

Dried petals of red roses, seven ounces,
Double refined sugar, six pounds,
Boiling water, five pounds.

Macerate the roses in the water for twelve hours, then boil them a little and strain the liquor; add to it the sugar, and boil them again for a little, so as to form a syrup.

In this preparation the slight astringency of the red rose is supposed to be preserved; and where a syrup having this quality is indicated, this is generally prefered.

Syrupus Scillæ Maritimæ. *Syrup of Squills.*

Take of

Acetous acid with squills, two pounds,
Double refined sugar in powder, three pounds and a half.

Dissolve the sugar with a gentle heat, so as to form a syrup.

This is an active remedy, and is the form under which squill is generally given as an expectorant.

Its dose is one or two drachms. It is also given to children as an emetic, especially in pertussis.

Syrupus Toluiferæ Balsami. *Syrup of Balsam of Tolu.* Balsamic Syrup.

Take of

Simple syrup, two pounds,
Tincture of balsam of tolu, one ounce.

With the syrup recently prepared, and when it has almost grown cold, after it has been removed from the fire, gradually mix the tincture, with constant agitation.

This syrup can be valued only on account of the agreeable flavour of the balsam with which it is moderately impregnated.

Syrupus Violæ Odoratæ. *Syrup of Violets.*

Take of

Flowers of fresh violets, one pound,
Boiling water, four pounds,
Double refined sugar, seven pounds and a half.

Macerate the violets in the water for twenty-four hours in a glass or a glazed earthen vessel, close covered; then strain without expression, and to the strained liquor add the sugar, powdered, and make into a syrup.

This syrup is a very gentle laxative, and as such is given to infants in a dose of one or two tea spoonfuls.

It is apt to lose in keeping the elegant blue colour, for which it is chiefly valued.

When pure it forms an excellent test of the presence of acids and alkalis; the former changing it to a red, the latter to a green colour. It is obvious that a prescriber would be deceived if he should expect to give any blue tinge to acidulated or alkalized juleps or mixtures, by the addition of the blue syrup.

CHAPTER XII.

MEDICATED VINEGARS.

Vinegar is capable of dissolving several of the principles of vegetables. It frequently, however, alters their powers, or does not coincide with them in virtue. There are, therefore, few medicated vinegars in use.

Acetum Aromaticum. *Aromatic Acetous Acid.* Aromatic Vinegar.

Take of

Tops of rosemary dried,
Leaves of sage dried, each four ounces,
Flowers of lavender dried, two ounces,
Cloves in coarse powder, two drachms,
Distilled acetous acid, eight pounds.

Macerate for seven days, express the liquor and filtrate through paper.

From the impregnation of the vinegar with the flavour of these aromatic vegetables, it becomes a grateful perfume, to which purpose chiefly this preparation is applied.

Acetum Scillæ Maritimæ. *Acetous Acid with Squills.* Squill Vinegar.

Take of

Dried root of squills, two ounces,
Distilled acetous acid, two pounds and a half,
Alcohol, three ounces.

Macerate the squills with the acetous acid for seven days; then press out the liquor, to which add the alcohol; and when the feces have subsided, pour off the clear liquor.

A preparation similar to that formerly kept under the name of *oxymel of squills*, may be made by mixing extemporaneously any quantity of honey with the above preparation.

Vinegar is the proper menstruum of squill; and this preparation possesses all its powers unimpaired. It is a very powerful stimulant; and hence it is frequently used, with great success, as a diuretic and expectorant. The dose is from a drachm to half an ounce; where crudities abound in the first passages, it may be given at first in a larger dose, to evacuate them by vomiting. It is most conveniently exhibited along with cinnamon, or other agreeable aromatic waters which prevent the nausea it would otherwise, even in small doses, be apt to occasion.

Acidum Acetosum Camphoratum. *Camphorated Acetous Acid.*

Take of

Strong acetous acid, six ounces,
Camphor, half an ounce.

Reduce the camphor to powder, by triturating it with a little alcohol; then add it to the acid, in which it should be dissolved.

This solution is a powerful analeptic remedy. Its vapour snuffed up the nostrils, which is the only method of using it, is one of the most pungent stimuli we possess. It is so extremely volatile, that it cannot be preserved without excluding it from the contact of the air; and it is so powerful a menstruum, that it corrodes cork, and almost all common metals except gold. It should therefore be kept in glass phials, with ground glass stoppers.

CHAPTER XIII.

TINCTURES.

Tinctures are solutions of vegetable, animal, and sometimes of mineral substances, in spirituous liquors. The solvent may be either pure alcohol, diluted alcohol, or alcohol impregnated with ammonia or ether. They generally contain the virtues of the substances dissolved, in a concentrated state, though sometimes altered, or lost in those of the menstruum. They are little liable to decomposition, and this gives them a superiority over those preparations in which the solvent power of water is employed. Alcohol is the solvent of a number of the immediate principles of vegetables; of resin, camphor, essential oil, and extract; and hence is capable of extracting the virtues of many important remedies. Tinctures made with it are in general decomposed on the addition of watery liquors.

Diluted alcohol, or proof spirit, is a still more general solvent; as the water it contains dissolves several principles which are not soluble in pure alcohol. It is therefore more generally employed. Alcohol, impregnated with ammonia, or ether, is employed in forming tinctures only of a few substances, whose operations are supposed to be promoted by these agents.

Tinctura Aloes Socotorinæ. *Tincture of Socotorine Aloes.*

Take of

Socotorine aloes in powder, half an ounce,
Extract of liquorice, an ounce and a half,
Alcohol, four ounces,
Water, one pound.

Digest for seven days in a closed vessel, with a gentle heat and frequent agitation, and when the feces have subsided, decant the tincture.

These directions are to be observed in preparing all tinctures.

In this simple tincture, all the active parts of the aloes are suspended in the menstruum. The extract of liquorice serves both to promote the suspension and to cover the taste of the aloes; and in those cases where we wish for the operation of the aloes alone, this is perhaps one of the best formulæ under which it can be exhibited in a fluid state. About an ounce may be taken for a dose.

TINCTURA ALOES ET MYRRHÆ. *Tincture of Aloes and Myrrh.* Elixir Proprietatis.

Take of

Myrrh in powder, two ounces,
Alcohol, one pound and a half,
Water, half a pound.

Mix the alcohol with the water, then add the myrrh; digest for four days; and lastly add of

Socotorine aloes in powder,
Saffron sliced, each two ounces.

Digest again for three days, and pour off the tincture from the sediment.

This may be considered as being the *Elixir Proprietatis* of Paracelsus, improved with regard to the manner of preparation. It has long been in repute as a warm stimulant and aperient. It strengthens the stomach and other viscera, cleanses the first passages from tenacious phlegm, and promotes the natural secretions in general. Its continued use has frequently done much service in cachectic and icteric cases, uterine obstructions, and other similar disorders; particularly in cold, pale, phlegmatic habits. The dose may be from one drachm to two, twice in a day. This preparation is rendered more pleasant and efficacious by age.

TINCTURA AMOMI REPENTIS. *Tincture of Cardamom.*

Take of

Lesser cardamom seeds bruised, four ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

Tincture of cardamom has been in use for a considerable time. It is a pleasant warm cordial, and may be taken, along with a proper vehicle, in doses of from a drachm to a spoonful or two.

TINCTURA ARISTOLOCHIÆ SERPENTARIÆ. *Tincture of Virginian Snakeroot.*

Take of

Root of Virginian snakeroot bruised, three ounces,
Cochineal in powder, one drachm,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This tincture, which contains the whole virtues of the root, may be taken to the quantity of a spoonful or more every five or six hours; and to this extent it often operates as an useful diaphoretic.

TINCTURA FERULÆ ASSÆ FOETIDÆ. *Tincture of Assa Fœtida.* Fetid Tincture.

Take of

Gum resin of assa fœtida, four ounces,
Alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This tincture possesses the virtues of the assa fœtida itself; and may be given in doses of from ten drops to fifty or sixty as a remedy in hysteria.

TINCTURA BENZOIN COMPOSITA. *Compound Tincture of Benzoin.* Traumatic Balsam.

Take of

Benzoin in powder, three ounces,
Peruvian balsam, two ounces.
Hepatic aloes in powder, half an ounce,
Alcohol, two pounds.

Digest with a gentle heat for seven days, and filtrate through paper.

This preparation may be considered as an elegant simplification of some very complicated compositions, which

were celebrated under different names; such as Wade's balsam, Friar's balsam, Jesuit's drops, &c. These, in general consisted of a confused farrago of discordant substances. They, however, derived considerable activity from the benzoin and aloes; and every thing to be expected from them, may readily be obtained from the present formula.

The compound tincture of benzoin, has been highly recommended, externally, for cleansing and healing wounds and ulcers, for discussing cold tumors, allaying gouty, rheumatic, and other old pains and aches; and likewise internally for warming and strengthening the stomach and intestines, expelling flatulences, and relieving colic complaints. Its dose is from thirty to sixty drops. In modern practice it is much less used than formerly.

TINCTURA CAMPHORÆ. *Tincture of Camphor.* Elixir of Camphor.

Take of

Camphor, one ounce,
Alcohol, one pound.

Mix them together, that the camphor may be dissolved.

It may also be made with a double or triple proportion of camphor.

This solution of camphor is only employed externally, against rheumatic pains, paralytic numbnesses, for discussing tumors, preventing gangrenes, or restraining their progress. Bruises and strains are also relieved by this application by way of friction to the part.

TINCTURA ELEUTHERIÆ. *Tincture of Cascarilla.*

Take of

Bark of cascarilla in powder, four ounces,
Diluted alcohol, two pounds.

Digest with a gentle heat for eight days and filtrate.

This tincture may be employed to answer most of those purposes for which the bark itself is recommended; but in the cure of intermittents, it in general requires to be exhibited in substance.

TINCTURA ANGUSTURÆ. *Tincture of Angustura.*

Take of

Bark of angustura in powder, four ounces,
Diluted alcohol, two pounds.

Digest with a gentle heat for eight days and filtrate.

In cases of dyspepsia this tincture has been found serviceable in doses of one or two drachms.

TINCTURA SENNÆ COMPOSITA. *Compound Tincture of Senna.* Elixir of Health.

Take of

Leaves of senna, three ounces,
Root of jalap bruised, one ounce,
Coriander seeds,
Caraway seeds, each bruised, half an ounce,
Lesser cardamom seeds bruised, two drachms,
Diluted alcohol, three pounds and a half.

Digest for seven days, and to the liquor filtrated through paper add of

Double refined sugar, four ounces.

This tincture is in very common use as a carminative and cathartic, by those especially who have accustomed themselves to the use of spirituous liquors; it oftentimes relieves flatulent complaints and colics, where the common cordials have little effect. Dose from one to two ounces.

TINCTURA CASTOREI. *Tincture of Castor.*

Take of

Russian castor in powder, an ounce and a half,
Alcohol, one pound.

Digest for seven days, and filtrate through paper.

This is a feeble remedy, given sometimes as an antispasmodic, in a dose of from half a drachm to a drachm.

TINCTURA CINCHONÆ OFFICINALIS. *Tincture of Cinchona.* Tincture of Bark.

Take of

Red bark of cinchona in powder, six ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

The active matter of bark is entirely extracted by diluted alcohol, but the powers of the menstruum itself do not allow of the use of bark under this form, where large doses of the remedy are necessary. It is used in dyspepsia, occasionally, in a dose of two drachms.

Tinctura Cinchonæ Composita. *Compound Tincture of Cinchona.* Huxham's Tincture.

Take of

Red bark of cinchona in powder, two ounces,
External rind of Seville oranges dried, one ounce and a half,
Root of Virginian snakeroot bruised, three drachms,
Saffron, one drachm,
Cochineal in powder, two scruples,
Diluted alcohol, twenty ounces.

Digest for fourteen days and filtrate.

This has been for a considerable time celebrated under the title of *Huxham's Tincture of Bark.*

As a corroborant and stomachic, it is given in doses of two or three drachms; but when employed for the cure of intermittents, it must be taken to a greater extent. It is more grateful than the simple tincture, and in dyspeptic affections, it proves a pleasant and efficacious remedy.

Tinctura Colombæ. *Tincture of Colomba.*

Take of

Colomba root in powder, two ounces and a half,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This is used merely as a bitter tincture in dyspepsia, in a dose of three or four drachms. It may be advantageously employed against bilious vomitings, and those different stomach ailments, in which the colomba has been found useful; but where there does not occur some objection to its use in substance, that form is in general preferable to the tincture.

TINCTURA CONVOLVULI JALAPÆ. *Tincture of Jalap.*

Take of

Root of jalap in powder, four ounces,
Diluted alcohol, fifteen ounces.

Digest for seven days and filtrate through paper.

The activity of jalap resides in its resin, which in this preparation is extracted along with a portion of mucilage. The tincture may be given as a cathartic, in a dose of four or six drachms.

TINCTURA CROCI SATIVA. *Tincture of Saffron.*

Take of

English saffron sliced, one ounce,
Diluted alcohol, fifteen ounces.

Digest for seven days and filtrate through paper.

This tincture is to be valued only for its colour.

TINCTURA DIGITALIS PURPUREÆ. *Tincture of Common Fox-Glove.*

Take of

Dried leaves of common fox-glove, one ounce,
Diluted alcohol, eight ounces.

Digest for seven days and filtrate through paper.

This is a very active preparation; it is the one in which the virtues of digitalis are longest preserved uninjured, and appears to be the best form under which that remedy can be exhibited, to obtain its narcotic effects. Its dose is ten drops, which, according to the general rules observed in the administration of digitalis, is to be gradually increased. It has been chiefly used to diminish the force of the circulation of the blood in hæmoptysis, and often with remarkable success. It is in this form that digitalis is generally exhibited for the cure of phthisis pulmonalis. The chief advocates for this remedy in England are undoubtedly men of eminence in their profession, some of whom were on its first introduction so extremely sanguine as to imagine that it approximates to a specific; although such expectations cannot be fully realized, it is evidently a remedy of great efficacy, some-

times effecting a radical cure, and seldom failing to alleviate the most distressing symptoms attending that fatal disease. The attestations and facts adduced in its favor are sufficient to encourage the most persevering trials in every case of incipient phthisis pulmonalis.

Tinctura Gentianæ Composita. *Compound Tincture of Gentian.* Stomachic Elixir.

Take of

Root of gentian sliced and bruised, two ounces.
Rind of Seville oranges dried and bruised, one ounce,
Bark of canella alba bruised, half an ounce,
Powder of cochineal, half a drachm,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This is a very elegant spirituous bitter, formerly called *stomachic elixir*. The aromatics are here very commodious ingredients, as in this spirituous menstruum they are free from the inconvenience with which they are attended in other liquors, of diminishing their transparency.

This tincture is employed in dyspepsia, in a dose of two or three drachms given occasionally.

Tinctura Guajaci Officinalis. *Tincture of Guaiacum.*

Take of

Gum resin of officinal guaiacum in powder. one pound,
Alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

What is called gum guaiac is in fact a resin, and perfectly soluble in alcohol. This solution is a powerful stimulating sudorific, and may be given in doses of about half an ounce in rheumatic and arthritic cases.

Tinctura Hellebori Nigri. *Tincture of Black Hellebore.*

Take of

Root of black hellebore bruised, four ounces,
Cochineal in powder, half a drachm,
Diluted alcohol, two pounds and a half.

Digest seven days and filtrate through paper.

This is perhaps the best preparation of hellebore, when designed for an alterative, the menstruum here employed extracting the whole of its virtues. It has been found by experience particularly serviceable in uterine obstructions. In sanguine constitutions, where chalybeates are hurtful, it has been said that it seldom fails of exciting the menstrual evacuations, and removing the ill consequences of their suppression. A tea spoonful of the tincture may be taken twice a day in warm water, or some other convenient vehicle.

Tinctura Hyosciami Nigri. *Tincture of Black Henbane.*

Take of

Leaves of black henbane dried, one ounce,
Diluted alcohol, eight ounces.

Digest for seven days and filtrate through paper.

This tincture, although not yet come into general use, is a valuable anodyne, and in many cases may be substituted with advantage for the tincture of opium, especially where the latter produces obstinate constipation; or, instead of its usual soporific and sedative effects, it causes uneasiness, restlessness, and universal irritation. Its dose is from a scruple to a drachm.

Tinctura Kino. *Tincture of Kino.*

Take of

Kino in powder, two ounces,
Diluted alcohol, a pound and a half.

Digest seven days and filtrate through paper.

This is certainly a very astringent tincture, and will be found an excellent medicine in obstinate diarrhœa and in lienteria. The dose is from half a drachm to a drachm.

TINCTURA LAURI CINNAMOMI. *Tincture of Cinnamon.*

Take of

Bark of cinnamon bruised, three ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This is used merely as an aromatic and cordial, in doses from one drachm to three.

TINCTURA CINNAMOMI COMPOSITA. *Compound Tincture of Cinnamon.* Aromatic Tincture.

Take of

Bark of cinnamon,
Lesser cardamom seeds, each bruised, one ounce,
Long pepper in powder, two drachms,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

In this formula, the Dublin and London colleges diminish the quantity of cardamom seeds, and substitute ginger. This makes no alteration on the virtues of the preparation, which is a warm aromatic, too hot to be given without dilution. It was formerly called *aromatic tincture.* A tea spoonful or two may be taken in wine, or any other convenient vehicle, in languors, weakness of the stomach, flatulences, and other similar complaints; and in these cases it is often employed with advantage.

TINCTURA LAVANDULÆ COMPOSITA. *Compound Tincture of Lavender.* Compound Spirit of Lavender.

Take of

Spirit of lavender, three pounds,
..... rosemary, one pound,
Bark of cinnamon bruised, one ounce,
Flower-buds of the clove tree bruised, two drachms,
Nutmeg bruised, half an ounce,
Wood of red saunders rasped, three drachms.

Macerate for seven days and filtrate.

This is a grateful cordial in common use, as relieving languor and faintness. From ten to one hundred drops

may be conveniently taken, dropped upon sugar. It does not appear very clearly whether it should be considered as a spirit or tincture; for although the spirit of lavender be the predominant ingredient, yet the mode of preparation is that of a tincture, and the spirit as a menstruum dissolves astringent colouring, and other substances, which would not rise with it in distillation.

Tinctura Meloes Vesicatorii. *Tincture of Cantharides.*

Take of

Cantharides bruised, one drachm,
Diluted alcohol, one pound.

Digest for seven days and filtrate through paper.

This tincture contains the active principle of the cantharides, whatever it may be. It is applied externally as a stimulant and rubefacient, and is sometimes given internally, in doses of from ten to twenty drops as a diuretic.

Tinctura Meloes Vesicatorii Fortior. *Strong Tincture of Cantharides.*

Take of

Cantharides bruised, ten drachms,
Diluted alcohol, one pound.

Digest for fourteen days and filtrate through paper.

This is intended merely for external application.

Tinctura Mimosæ Catechu. *Tincture of Catechu.* Japonic Tincture.

Take of

Extract of catechu in powder, three ounces,
Bark of cinnamon bruised, two ounces,
Diluted alcohol, two pounds and a half.

Digest for eight days and filtrate through paper.

The cinnamon is a very useful addition to the catechu, not only as it warms the stomach, &c. but likewise as it improves the roughness and astringency of the other. This tincture is of service in all kinds of defluxions, catarrhs, loosenesses, uterine fluors, and other disorders, where mild astringent medicines are indicated.

Two or three tea spoonfuls may be taken frequently in red wine, or any other proper vehicle.

Tinctura Moschi. *Tincture of Musk.*

Take of

Musk, two drachms,
Alcohol, one pound.

Macerate for seven days and filtrate.

In this form it is almost impossible to give such a quantity of musk as is necessary for our purpose; and hence this article is more frequently employed under the form of julep or bolus.

Tinctura Muriatis Ammoniæ et Ferri. *Tincture of Muriate of Ammonia and Iron.* Ammoniac Tincture of Iron.

Take of

Muriate of ammonia and iron, four ounces,
Diluted alcohol, sixteen ounces.

Digest and filtrate.

This is seldom prepared, being much less elegant than the following.

Tinctura Muriatis Ferri. *Tincture of Muriate of Iron.* Tincture of Iron.

Take of

Carbonate of iron, half a pound,
Muriatic acid, three pounds,
Alcohol, three pounds and four ounces.

Pour the muriatic acid on the carbonate of iron in a glass vessel; and shake the mixture now and then, during three days. Set it by, that the feces may subside; then pour off the liquor; evaporate this to sixteen ounces, and when cold, add to it the alcohol.

The black oxide of iron combines with the muriatic acid, and, during the solution, acquires more oxygen, partly by absorption from the atmosphere, and partly by decomposition of the water, which is promoted by the

heat applied. The muriate of iron, in which this more perfect oxide is contained, is soluble in alcohol. The present preparation is such a tincture diluted with the water of the muriatic acid. When first prepared, it contains a portion of muriate of iron, in which the metal is imperfectly oxidated; but this soon attracts more oxygen; and hence, the colour of the tincture deepens on keeping. It is a very active and excellent chalybeate, and may be given in doses of ten or twenty drops, twice or thrice a day, in any proper vehicle.

The muriated tincture of iron is a remedy which often proves extremely efficacious in suppressions of urine arising from spasm, if given in doses of ten drops, and repeated every ten minutes until some sensible effect is produced, it will seldom fail of removing the spasm, and after six doses the urine usually flows freely.

Tinctura Myrrhæ. *Tincture of Myrrh.*

Take of

Myrrh in powder, three ounces,
Alcohol, twenty ounces,
Water, ten ounces.

Digest for seven days and filtrate through paper.

Tincture of Myrrh is recommended internally for warming the habit, attenuating viscid juices, strengthening the solids, opening obstructions, particularly those of the uterine vessels, and resisting putrefaction. The dose is from fifteen to forty drops, or more. It may perhaps be given in these cases to advantage; though it is more commonly used externally as a stimulant and antiseptic application for cleansing foul ulcers, and promoting the exfoliation of carious bones.

Tinctura Opii. *Tincture of Opium. Thebaic Tincture.* Liquid Laudanum.

Take of

Opium, two ounces,
Diluted alcohol, two pounds.

Digest seven days and filtrate through paper.

This tincture is the most usual form under which opium is administered, having long been known under the name of *liquid laudanum*.

The proportion of opium to the solvent is five grains to the drachm; but by evaporation it is found that one drachm of the tincture holds three grains and a half dissolved. The usual dose is twenty-five drops. It is to be regretted that this tincture is not so well adapted for keeping as could be wished; in long standing a part of the opium is gradually deposited, and consequently the tincture becomes weaker; the part which thus separates amounts sometimes, as it is said, to near one fourth of the quantity of opium at first dissolved.

The occasions for the use of laudanum in families are so numerous, that the utmost certainty with regard to the uniformity of the strength, and the dose, ought to prevail. According to the London College, ten drachms of opium go to one pint of proof spirit. Dr. Donald Monroe observes, one drachm (sixty drops,) of such tincture, contains, by experiment, three and two thirds grains of opium; so that three drachms of it contains eleven grains: hence if we mix eight drachms of proof spirit, with three drachms of the above tincture, we form a tincture, each drachm of which contains one grain of opium; if we want a still weaker preparation, we may add eleven drachms more of *spirit*, when we shall have a tincture, each drachm of which contains half a grain of opium. In most cases, however, it is adviseable to administer *laudanum* in small quantities, (say fifteen drops to a grown person,) at a time, until the desired effect be produced. A single full dose of twenty, thirty, or thirty-five drops, will frequently disappoint our wishes, by proving either too great, or too small a quantity for the necessities of the system. *Laudanum* should always be given in a perfectly pure state: that which has by long keeping deposited a portion of the opium previously held in solution, and thereby become thick, and strong, should be marked, and reserved for external application.

TINCTURA OPII CAMPHORATA. *Camphorated Tincture of Opium.* Paregoric Elixir.

Take of

Opium,
Benzoic acid, of each one drachm.
Camphor, two scruples,
Volatile oil of aniseed, one drachm.
Diluted alcohol, two pounds.

Digest for ten days and filtrate through paper.

In this formula the virtues of the opium and camphor are combined. It gets an agreeable flavour from the acid of benzoin, and the essential oil. The latter will also render it more stimulating; but whether it derives any salutary virtues from the former, we do not know. It was originally prescribed under the title of elixir asthmaticum, which it does not ill deserve. It tends to allay the tickling which provokes frequent coughing, and, at the same time, it is supposed to open the breast, and give greater liberty of breathing. It is given to children against the chin cough, &c. from five to twenty drops; to adults, from twenty to an hundred. Half an ounce, by measure, contains about a grain of opium.

TINCTURA RHEI PALMATI. *Tincture of Rhubarb.*

Take of

Root of rhubarb in coarse powder, three ounces,
Lesser cardamom seeds bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This tincture contains all the virtues of rhubarb. Its dose is from half an ounce to an ounce.

TINCTURA RHEI ET ALOES. *Tincture of Rhubarb and Aloes.* Sacred Elixir.

Take of

Root of rhubarb in coarse powder, ten drachms,
Socotorine aloes in powder, six drachms,
Lesser cardamom seeds bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

TINCTURA RHEI ET GENTIANÆ. *Tincture of Rhubarb and Gentian.* Bitter Tincture of Rhubarb.

Take of

Root of rhubarb in coarse powder, two ounces,
Root of gentian sliced and bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

TINCTURA RHEI DULCIS. *Sweet Tincture of Rhubarb.*

Take of

Root of rhubarb in coarse powder, two ounces,
Root of liquorice bruised,
Anise seeds bruised, each one ounce,
Double refined sugar in powder, two ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

All the foregoing tinctures of rhubarb, are designed as stomachics and corroborants, as well as purgatives; spirituous liquors excellently extract those parts of the rhubarb in which the two first qualities reside, and the additional ingredients considerably promote their efficacy. In weakness of the stomach, indigestion, laxity of the intestines, diarrhœas, colic, and other similar complaints, these medicines are frequently of great service. The sacred elixir has been much employed as a warming cordial purge, and for the general purposes of aloetics, with which, however, it combines the medical properties of rhubarb.

A spoonful or two may be taken for a dose, and occasionally repeated.

TINCTURA SAPONIS. *Tincture of Soap.* Saponaceous Liniment.

Take of

Soap in shavings, four ounces,
Camphor, two ounces,
Volatile oil of rosemary, half an ounce,
Alcohol, two pounds.

Digest the soap in the alcohol for three days; then add to the filtrated liquor, the camphor and oil, agitating them diligently.

TINCTURA SAPONIS ET OPII. *Tincture of Soap and Opium.* Anodyne Balsam.

This is prepared in the same way and from the same substances as the tincture of soap, but with the addition from the beginning of one ounce of opium.

These tinctures are used externally as powerful stimulant applications in strains and rheumatic pains. The latter long known under the title of *anodyne balsam*, possesses great efficacy in removing local pains, especially if a tea spoonful be at the same time taken internally.

Tinctura Scillæ Maritimæ. *Tincture of Squill.*

Take of

Root of squills fresh dried and bruised, four ounces,
Diluted alcohol, two pounds.

Digest for eight days and pour off the liquor.

As vinegar best covers the nauseous taste of squill, it is generally used as its menstruum. This tincture contains, however, the active matter of this, and may be given in a dose of from twenty to sixty drops.

Tinctura Toluiferæ Balsami. *Tincture of Balsam of Tolu.*

Take of

Balsam of tolu, an ounce and a half,
Alcohol, one pound.

Digest until the balsam be dissolved, and then filtrate the tincture through paper.

This solution of balsam of tolu possesses all the virtues of the balsam itself. It may be taken internally, with the several intentions for which that valuable balsam is proper, to the quantity of a tea spoonful or two, in any convenient vehicle. Mixed with the plain syrup of sugar, it forms an elegant balsamic syrup.

Tinctura Veratri Albi. *Tincture of White Hellebore.*

Take of

Root of white hellebore bruised, eight ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This tincture has seldom been employed, and is now altogether superseded by the vinous tincture of the same root mentioned under Veratrum Album in the Materia Medica.

Tinctura Humuli. *Tincture of Hop.*

Take of

Hops, five ounces,
Proof spirit, two pints.

Macerate for fourteen days, and strain.

Hop having been introduced as a narcotic, the tincture affords a convenient form for its administration. It has been supposed to be nearly of the same strength as tincture of opium, but it requires in general to be given in a dose of from half a drachm to a drachm, to produce much sensible effect.

TINCTURES MADE WITH ETHERIAL SPIRITS.

We have classed these tinctures by themselves, because they are more strongly characterized by the nature of the menstruum, than of the substances dissolved in it. Indeed, the etherial spirits are used in these instances, not to dissolve bodies which would resist the action of the alcohol and water, but for the sake of their own direct action on the body.

Tinctura Aloes Ætherea. *Etherial Tincture of Aloes.* Vitriolic Elixir Proprietatis.

Take of

Gum resin of socotorine aloes,
Myrrh, of each in powder an ounce and a half,
English saffron sliced, one ounce,
Sulphuric ether with alcohol, one pound.

Digest the myrrh with the liquor for four days in a close vessel, then add the saffron and aloes.

Digest again for four days, and when the feces have subsided, pour off the tincture.

By first digesting the myrrh with the spirit, a sufficient quantity of it is dissolved, which would not be, were the aloes added to it; and, by the second digestion, a sufficient quantity of the latter is taken up. The formula is the improvement of one which has long kept its place in the different pharmacopœias. It agrees generally in its

effects, with the other tinctures of aloes, the only difference arising from the more penetrating and stimulating nature of the menstruum itself. As a purgative, it is given in doses of one or two drachms.

Æther Sulphuricus cum Alcohole Aromaticus. *Aromatic Sulphuric Ether with Alcohol.*

This is made of the same aromatics, and in the same manner as the compound tincture of cinnamon; except that in place of the alcohol, sulphuric ether with alcohol is employed.

The additions to the sulphuric ether in this formula, are of so little importance, that the preparation is scarcely ever used.

Acidum Sulphuricum Aromaticum. *Aromatic Sulphuric Acid.* Acid Elixir of Vitriol.

Take of

Alcohol, two pounds,
Sulphuric acid, six ounces.

Drop the acid gradually into the alcohol.

Digest the mixture with a very gentle heat in a close vessel for three days, and then add of

Bark of cinnamon bruised, an ounce and a half,
Root of ginger bruised, one ounce.

Digest again in a close vessel for six days, and then filtrate the tincture through paper placed in a glass funnel.

This is a valuable medicine in weakness and relaxation of the stomach, and decays of the constitution, particularly in those which proceed from irregularities, which are accompanied with slow febrile symptoms, or which follow the suppression of intermittents. It frequently succeeds, after bitters and aromatics, by themselves, had availed nothing; and, indeed, great part of its virtues depend on the sulphuric acid, which, barely diluted with water, has, in cases where the stomach could bear acidity, produced happy effects. It is very usefully conjoined with cinchona, and other tonic barks, both as covering their disagreeable taste, and as coinciding with them in virtue. It may be given in doses of from ten to thirty drops, or more, several times a day.

AMMONIATED OR VOLATILE TINCTURES.

ALCOHOL AMMONIATUM AROMATICUM. *Aromatic Ammoniated Alcohol.*

Take of

Ammoniated alcohol, eight ounces,
Volatile oil of rosemary, one drachm and a half,
Volatile oil of lemon peel, one drachm.

Mix them, that the oils may be dissolved.

By this combination of the ammonia with the alcohol, and the addition of the aromatic oils, it is rendered more grateful than the water of ammonia. This preparation is therefore sometimes used in preference to the other, as a stimulating perfume, and even for internal exhibition. Dose from fifteen to thirty drops.

TINCTURA CASTOREI COMPOSITA. *Compound Tincture of Castor.*

Take of

Russian castor in powder, one ounce.
Gum resin of assa fœtida, half an ounce,
Ammoniated alcohol, one pound.

Digest for seven days in a close stopped phial, and filtrate through paper.

This composition is a medicine of real efficacy, particularly in hysterical disorders, and the several symptoms which accompany them. The spirit here used is an excellent menstruum, both for the castor and the assa fœtida, and greatly adds to their virtues. The dose is from half a drachm, to one drachm.

TINCTURA GUAJACI AMMONIATA. *Ammoniated Tincture of Guaiacum.* Volatile Elixir of Guaiacum.

Take of

Gum resin of officinal guaiacum, four ounces,
Ammoniated alcohol, one pound and a half.

Digest for seven days and filtrate through paper.

This is a very elegant and efficacious tincture; the ammoniated spirit readily dissolving the resin, and at the same time promoting its medicinal virtue. In rheumatic

cases, a tea or even table spoonful, taken every morning and evening, in any convenient vehicle, particularly in milk, has proved of singular service.

Or it may be prepared as follows:

Take of

Gum guaiacum, eight ounces,
Pimento in powder, two ounces,
Subcarbonate of potass, two drachms,
Alcohol diluted, two pounds.

Digest for seven days and filtrate through paper.

To four ounces of this tincture add ammoniated alcohol one ounce, more or less, as the case may require.

Tinctura Opii Ammoniata. *Ammoniated Tincture of Opium.*

Take of

Benzoic acid,
English saffron sliced, each three drachms,
Opium two drachms,
Volatile oil of anise seeds, half a drachm,
Ammoniated alcohol, sixteen ounces.

Digest for seven days in a close vessel, and filtrate through paper.

This is a preparation of considerable efficacy in many spasmodic diseases, as chincough, &c. the ammonia removing the spasm immediately, while the opium tends to prevent its return. Each drachm contains about a grain of opium under the name of *paragoric elixir*. This preparation has been highly esteemed in catarrhal affections, and other complaints of the breast. Its dose is from half a drachm to a drachm.

CHAPTER XIV.

MEDICATED WINES.

Wine, from its composition, and especially from the alcohol and water it contains, is capable of dissolving the active matter of many vegetables. Solutions of this kind are named *medicated wines*. They are more liable to decomposition from keeping than tinctures. To obviate this, it is usual to add to them, when prepared, a portion of alcohol.

Vinum Aloes Socotorinæ. *Wine of Socotorine Aloes.* Sacred Tincture.

Take of

Gum resin of socotorine aloes in powder, one ounce,
Lesser cardamom seeds bruised,
Root of ginger bruised, each one drachm,
Spanish white wine, two pounds.

Digest for seven days, stirring now and then, and afterwards filtrate.

This medicine has long been in great esteem, not only as a cathartic, but likewise as a stimulus. It appears, from long experience, to be a medicine of great utility. The dose, as a purgative, is from one to two ounces. It may be introduced into the habit, so as to be productive of excellent effects as an alterant, by giving it in small doses, at proper intervals; thus managed, it does not for a considerable time operate remarkably by stool; but at length proves purgative, and occasions a lax habit of much longer continuance, than that produced by other cathartics.

Vinum Ferri. *Wine of Iron.* Chalybeate Wine.

Take of

Purified filings of iron, one ounce,
Spanish white wine, sixteen ounces.

Digest for a month, often shaking the vessel, and then filtrate.

This is merely a solution of tartarized iron in wine; for the iron is only dissolved in the wine by means of the super-tartrite of potass it contains. But a solution of a known proportion of tartarized iron in wine, will give a medicine of more equal powers, and may be made extemporaneously. The dose is from a drachm to half an ounce, twice or thrice a day in chlorotic cases.

Vinum Gentianæ Compositum. *Compound Wine of Gentian.* Bitter Wine.

Take of

Root of gentian sliced and bruised, half an ounce,
Red bark of cinchona in powder, one ounce,
External rind of Seville oranges, dried and bruised, two drachms,
Bark of canella alba in powder, one drachm,
Diluted alcohol, four ounces,
Spanish white wine, two pounds and a half.

First, pour on the diluted alcohol, and after twenty-four hours, add the wine; then macerate for seven days and filtrate.

This wine is intended to supply the place of the *Vinum Amarum*, as it was formerly called.

Wine is fully capable of extracting the active powers of the different ingredients; and it supplies us with a very useful and elegant stomachic medicine. Its dose is six drachms.

Vinum Ipecacuanhæ. *Wine of Ipecacuan.*

Take of

Root of ipecacuan in powder, one ounce,
Spanish white wine, fifteen ounces.

Macerate for seven days and filtrate through paper.

This medicated wine is preferable to a tincture of ipecacuan, as being less pungent, while it holds the active matter of the root fully dissolved. Its dose, as an emetic, is one ounce to an adult.

Vinum Nicotianæ Tabaci. *Wine of Tobacco.*

Take of

Dried leaves of tobacco sliced, one ounce,
Spanish white wine, one pound.

Macerate for seven days and filtrate through paper.

We have already, under the article *Nicotiana* in the Materia Medica, offered some observations upon its introduction into practice by Dr. Fowler, as a very useful remedy in the cure of dropsies and dysuries. From his treatise on that subject, the present formula is taken; and we may observe, that while in practice, we have frequently experienced from tobacco those good effects, for which Dr. Fowler recommends it, we are inclined to give the present formula the preference to every other which he has proposed.

Dose, thirty drops, gradually increased to sixty or eighty, twice a day.

Vinum Opii Compositum. *Compound Wine of Opium.* Thebaic Tincture.

Take of

Opium, two ounces,
Flower buds of the clove tree bruised,
Cinnamon bruised, each one drachm,
Spanish white wine, sixteen ounces.

Macerate for seven days and filtrate through paper.

This is the *liquid laudanum* of Sydenham, with the exchange of Canary wine for Mountain, and the omission of an ounce of saffron; and was the tinctura thebaica, or liquid laudanum, of the London pharmacopœia. The aromatics here directed are in so small quantity, that no considerable effect can be expected from them, the proportion of each that goes to a grain of opium amounting to no more than the sixteenth part of a grain. Even the minute proportions, however, are in a good measure sufficient to take off the ill odour of the opium, which seems to be all that is intended by them.

The principal advantages of exhibiting opium in this form are, that by being already dissolved, it exerts itself sooner in the body, and that by some persons, liquids are more commodiously taken, than a bolus or pill. The

common doses of the tincture are from *ten drops to forty, fifty, or more*, according to the exigencies of the case. It is to be wished that the dose could be more exactly ascertained, by weight or measure; as the drops may, according to different circumstances, vary in quantity, though in number the same; and as an error therein may, in some cases, be of mischievous consequences. *Twenty drops contain, at a medium, about one grain of opium*, or rather so much as that quantity of wine will extract from one grain; for the liquor does not dissolve the whole substance of the opium, nor is the solution equivalent, in its effect, to the full quantity of opium employed in it.

A liquid opiate, free from the inconveniences here complained of, may be found under the head of tinctures, page 510.

Vinum Rhei Palmati. *Wine of Rhubarb.*

Take of

Root of rhubarb sliced, two ounces,
Bark of canella alba bruised, one drachm,
Diluted alcohol, two ounces,
Spanish white wine, fifteen ounces.

Macerate for seven days and filtrate through paper.

This is a warm, cordial, laxative medicine. It is used chiefly in weakness of the stomach and bowels, and some kinds of loosenesses, for evacuating the offending matter, and strengthening the tone of the viscera. Its dose as a purgative is from half an ounce to an ounce.

Vinum Tartitris Antimonii. *Wine of Tartrite of Antimony.* Antimonial Wine.

Take of

Tartrite of antimony, twenty-four grains,
Spanish white wine, one pound.

Mix them so that the tartrite of antimony may be dissolved.

Tartrite of antimony dissolved in wine, can be preserved longer without decomposition than when dissolved in water; but, even on long keeping, part of the antimonial oxide is deposited. In its employment and effects,

the vinous solution of tartar emetic does not differ from one made with water. It is given as an emetic in the dose of one ounce; as a diaphoretic, in a much smaller dose. It contains two grains of tartrite of antimony in the ounce, but it is not of sufficient strength. The formula directed by the London and Dublin Colleges, containing four grains in the ounce, will be found more convenient in practice.

In the old formula for the preparation of *antimonial wine*, vitrified (glass) of antimony was directed to be used; but as the tartarous acid contained in the wine acts on the oxide of antimony, and renders part of it soluble, the quantity must be uncertain, and the wine cannot be uniform in strength. The preparation, therefore, ought to be entirely rejected, since its strength cannot be known.

CHAPTER XV.

EXTRACTS.

EXTRACTS MADE WITH WATER.

When vegetable matter is dissolved in water or alcohol, by evaporation of the solvent, a concrete tenacious mass is obtained, termed an extract. When prepared from an aqueous solution, it is named a watery, when from one in alcohol, pure or diluted, a spirituous extract. The former must consist chiefly of those proximate principles which water can easily dissolve; mucilage, tannin, extractive, and saline matter: the latter, of a portion of these with resin.

In either preparation, the volatile principles must necessarily be dissipated; and in many cases, especially in the preparation of the watery extracts, decomposition or oxygenation of the more fixed parts take place. Hence there are few vegetables whose virtues are obtained uninjured in their extracts. Water is the menstruum most economically employed in making extracts, as it is capable of dissolving all the active principles except resin, and can have its solvent powers assisted by a considerable degree of heat.

It is indifferent, with regard to the medicine, whether the subject be used fresh or dry, since nothing that can be preserved in this process, will be lost by drying.

The evaporation is most conveniently performed in large, shallow vessels; the larger the surface of the liquor, the sooner will the aqueous parts exhale. It is necessary to keep a constant stirring toward the end of the process, in order to prevent an empyreuma, and that the extracts may be of an uniform consistence, and free of clots.

Extractum Gentianæ Luteæ. *Extract of Gentian.*

Take of

Root of gentian, any quantity.

Having cut and bruised it, pour upon it eight times its quantity of water. Boil to the consumption of one half

of the liquor, and strain it by strong expression. Evaporate the decoction immediately to the consistence of thick honey, in a bath of water saturated with muriate of soda.

This extract is intensely bitter. It is generally used to form other medicines into pills, particularly those with which it coincides in medicinal virtues, as tonics and emmenagogues.

In the same manner are prepared

From the roots of

Liquorice, *Extractum glycyrrhizæ glabræ.* Extract of liquorice.

Black hellebore, *Extractum hellebori nigri.* Extract of black hellebore.

From the inner bark of

Butternut, *Extractum juglandis cinereæ.* Extract of butternut.

From the leaves of

Rue, *Extractum rutæ graveolentis.* Extract of rue.

Senna, *Extractum cassiæ sennæ.* Extract of senna.

From the flowers of

Chamomile, *Extractum anthemidis nobilis.* Extract of chamomile.

From the capsules of

White poppy, *Extractum papaveris somniferi.* Extract of white poppy.

From the wood of

Logwood, *Extractum hæmatoxyli campechensis.* Extract of logwood.

All these extracts are supposed to contain the virtues of the substances from which they are prepared, in a very pure and concentrated form. But this supposition is, we believe, in several instances erroneous. Extract of liquorice root consists chiefly of mucilage and saccharine matter, and is used as a demulcent in catarrh. It is sometimes purified by solution in water, straining, and a new evaporation. This is named refined liquorice. When made with care, it is exceedingly sweet, not at all bitterish or nauseous, more agreeable in taste than the root itself, of a pleasant smell, and reddish brown colour. This preparation would be very convenient for many purposes in the shops, if kept in a somewhat softer consistence than that of an extract.

EXTRACTS MADE WITH ALCOHOL AND WATER.

Extractum Cinchonæ Officinalis. *Extract of Cinchona.* Extract of the bark.

Take of

Bark of cinchona in powder, one pound,
Alcohol, four pounds.

Digest for four days, and pour off the tincture.

Boil the residuum in five pounds of distilled water for fifteen minutes, and filtrate the decoction boiling hot through linen. Repeat this decoction and filtration with an equal quantity of distilled water, and reduce the liquor by evaporation to the consistence of thin honey. Draw off the alcohol from the tincture by distillation, until it also become thick; then mix the liquors thus inspissated, and evaporate in a bath of boiling water, saturated with muriate of soda, to a proper consistency.

This preparation is undoubtedly preferable to the watery extract of bark. By the joint action of the alcohol and water, every principle adhering to the mere ligneous fibre of the bark, is dissolved; and in the subsequent evaporation, the dissolved matter suffers less injury, partly from less heat being required to bring it to the due consistence, and partly, perhaps, from the alcohol resisting the oxygenation of the extract. It is, however, much more expensive; and the extract of bark to be found in the shops, is generally that prepared by the preceding formula. The dose of this extract is ten grains.

Extractum Convolvuli Jalapæ. *Extract of Jalap.*

This is prepared in the same way.

This extract as a cathartic is capable of operating fully in a dose of ten or twelve grains.

CHAPTER XVI.

OF POWDERS.

This form is proper for such materials only, as are capable of being sufficiently dried for pulverizing, without the loss of their virtue. There are many substances, however, of this kind which cannot be conveniently taken in powder; bitter, acrid, and fetid drugs are too disagreeable; emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth; fix'd alkaline salts deliquesce when exposed to the air; and volatile alkalis exhale. Many of the aromatics, too, suffer great loss of their odorous principle when kept in powder, as in that form they expose a much larger surface to the air.

The dose of powders, in extemporaneous prescription, is generally about half a drachm; it rarely exceeds a whole drachm, and is not often less than a scruple. Substances which produce powerful effects in smaller doses are not trusted to this form, unless their bulk be increased by additions of less efficacy; those which require to be given in larger ones are better fitted for other forms.

The usual vehicle for taking the lighter powders, is any agreeable thin liquid. The ponderous powders, particularly those prepared from metallic substances, require a more consistent vehicle, as syrups; for from thin ones, they soon subside.

Pulvis Cinnamomi Compositus. *Compound Powder of Cinnamon.* Aromatic Species.

Take of

Bark of cinnamon,
Lesser cardamom seeds,
Root of ginger, each equal parts.

Reduce them to a very fine powder, which is to be kept in a glass vessel well closed.

This formula is a very eligible one, and may be administered in all cases where powerful aromatic medicines are required. Its dose is from ten to twenty grains. Under the title of *aromatic powder* it has been employed in cold phlegmatic habits, and decayed constitutions, for warming the stomach, promoting digestion, and strengthening the tone of the viscera.

PULVIS ASARI COMPOSITUS. *Compound Powder of Asarabacca.* Sternutatory.

Take of

Leaves of asarabacca, three parts,
..... sweet marjorum,
Flowers of lavender, each one part.

Rub them together to a powder.

This is an efficacious errhine, and superior to herb snuff. It is often employed with great advantage in cases of obstinate headach, and of ophthalmias resisting other modes of cure. Five or six grains snuffed up the nostrils at bed time will operate the succeeding day as a powerful errhine, inducing frequent sneezing, and a copious discharge from the nose.

PULVIS CARBONATIS CALCIS COMPOSITUS. *Compound Powder of Carbonate of Lime.* Chalk powder.

Take of

Prepared carbonate of lime, four ounces,
Nutmeg, half a drachm,
Bark of cinnamon, one drachm and a half.

Reduce them together to powder.

The addition of the aromatics in the above formula, coincides with the general intention of the remedy, which is indicated for weakness and acidity in the stomach, and in diarrhœa proceeding from acidity. Dose from a scruple to a drachm.

PULVIS IPECACUANHÆ ET OPII. *Powder of Ipecacuan and Opium.* Dover's Powder.

Take of

Root of ipecacuan in powder,
Opium, of each one part,
Sulphate of potass, eight parts.

Triturate them together into a fine powder.

The sulphate of potass, from the grittiness of its crystals, is perhaps better fitted for tearing and dividing the tenacious opium, than any other salt. The operator should be careful that the opium and ipecacuan be equally diffused through the whole mass of powder, otherwise different portions of the powder must be different in degree of strength.

In this composition we have an example of the power which one medicine has of modifying the action of another, the ipecacuan rendering the operation of the opium as a sudorific, much more certain than it would otherwise be, and appearing also to diminish its narcotic effect. This powder is the most certain sudorific we possess, and as such was recommended by Dr. Dover as an effectual remedy in rheumatism. Modern practice confirms its reputation, not only in rheumatism, but also in dropsy, and several other diseases, where it is often difficult by other means to produce a copious sweat. The medium dose is fifteen grains; the operation of which is to be assisted by the sweating regimen; and frequently it is necessary to give additional smaller doses at intervals, to produce sweat.

PULVIS JALAPÆ COMPOSITUS. *Compound Powder of Jalap.*

Take of

Root of jalap, one part,
Super-tartrite of potass, two parts.

Grind them together to a very fine powder.

By this addition of super-tartrite of potass to jalap, the operation of the latter is supposed to be rendered less irritating, and more refrigerant. It is an excellent cathartic, operating freely in a dose of a drachm and an half.

Pulvis Opiatus. *Opiate Powder.*

Take of

Opium, one part,
Prepared carbonate of lime, nine parts.

Rub them together to a very fine powder.

In this powder, the opium is the only active ingredient; it is merely divided by the substance mixed with it. Ten grains contain one grain of opium.

Pulvis Scammonii Compositus. *Compound Powder of Scammony.*

Take of

Gum resin of scammony,
Super-tartrite of potass, equal parts.

Rub them together to a very fine powder.

In this powder, the operation of the scammony is supposed to be rendered milder as a purgative, by the supertartrite of potass. It is also preferred to the scammony alone, as a hydragogue cathartic. Its dose is from ten to twenty grains.

Pulvis Super-Sulphatis Aluminæ et Potassæ Compositus. *Compound Powder of Super-Sulphate of Alumina and Potass.* Styptic Powder.

Take of

Super sulphate of alumina and potass, four parts,
Kino, one part.

Rub them together to a fine powder.

This powder is composed of two very powerful astringents, and is sometimes used internally in menorrhagia, in repeated doses of ten or fifteen grains, and externally as a styptic application to bleeding wounds.

PULVIS ALOES CUM CANELLA. *Powder of Aloes with Canella.*

Take of

Socotorine aloes, one pound,
White canella, three ounces.

Powder separately, and then mix them.

This composition has long been known in the shops under the title of *hiera picra*. It is still retained in the London Pharmacopœa. It furnishes us with a useful aloetic purgative, the canella operating as a good corrigent for the aloes. It is generally made into a tincture, by infusing in spirits.

PULVIS ASTRAGALI TRAGACANTHÆ COMPOSITUS. *Compound Powder of Tragacanth.*

Take of

Gum tragacanth,
..... arabic,
Starch, of each one ounce and a half,
Double refined sugar, three ounces.

To be conjointly pulverized.

This preparation is one of the mildest emollient remedies in hectic cases, coughs, strangury, and similar disorders, occasioned by a thin, vitiated state of the fluids; the dose being two or three drachms often repeated.

CHAPTER XVII.

CONSERVES AND ELECTUARIES.

In these preparations, vegetable matter bruised is mixed with about three times its weight of sugar, and beat into a uniform pulpy mass. It was supposed that the sugar, by its antiseptic quality would prevent the decomposition of the vegetable matter. This, however, is not the case. This form of preparation therefore, is not applied to any active medicine. The shops were formerly encumbered with many conserves altogether insignificant; the few now retained, have, in general, either an agreeable flavour to recommend them, or are capable of answering some useful purposes as medicines. The sugar should be pounded by itself, and passed through a sieve, before it be mixed with the vegetable mass, for without this it cannot be properly incorporated. The common dose is the bulk of a nutmeg, or as much as can be taken at once or twice on the point of a knife.

Electuaries are compositions of the consistence, nearly of honey, and are generally made by adding to any powder, a sufficient proportion of syrup or mucilage. It is a form adapted to the exhibition of such medicines as are not ungrateful in taste or flavour. The ingredients are so proportioned, that the dose shall not be less than a teaspoonful, and not more than twice or thrice that quantity at a time.

Conserve of the outer rind of oranges, and conserve of red rose buds, require no particular remarks, except that their taste and virtues are compounded of those of sugar and the substance combined with it. The former is a pleasant stomachic, and the latter, a mild astringent.

Electuarium Aromaticum. *Aromatic Electuary.* Cardiac Confection.

Take of

Compound powder of cinnamon, one part,
Syrup of orange peel, two parts.

Mix and beat them well together, so as to form an electuary.

This composition is sufficiently grateful, and moderately warm. It is given in the form of a bolus, in doses of from five grains to a scruple, or upwards, as a cordial, or as a vehicle for more active substances.

ELECTUARIUM CASSIÆ FISTULÆ. *Electuary of Cassia.*

Take of

Pulp of the fruit of the cassia tree, six ounces,
Pulp of tamarinds,
Manna, each an ounce and a half,
Syrup of damask roses, six ounces.

Having beat the manna in a mortar, dissolve it in a gentle heat in the syrup; then add the pulps and evaporate them with a regular continued heat to the consistence of an electuary.

This composition is a very convenient officinal, to serve as a basis to purgative electuaries and other similar purposes. It is likewise taken by itself to the quantity of two or three drachms occasionally, for gently loosening the belly in costive habits.

ELECTUARIUM CASSIÆ SENNÆ. *Electuary of Senna.*
Lenitive Electuary.

Take of

Leaves of senna, eight ounces,
Coriander seeds, four ounces,
Root of liquorice, three ounces,
Figs,
Pulp of prunes, each one pound,
..... of tamarinds, half a pound,
Double refined sugar, two pounds and a half.

Powder the senna with the coriander seeds, and sift out ten ounces of the mixed powder. Boil the remainder with the figs and liquorice in four pounds of water, to one half; then press out and strain the liquor. Evaporate this strained liquor to the weight of about a pound and a half; then add the sugar, and make a syrup; add this syrup by degrees to the pulps, and, lastly, mix in the powder.

This electuary is a very convenient laxative, and has long been in common use among practitioners. Taken to the size of a nutmeg or more, as occasion may require, it is an excellent laxative for loosening the belly in costive habits.

Electuarium Catechu. *Electuary of Catechu.* Japonic Confection.

Take of

Extract of catechu, four ounces,
Kino, three ounces,
Bark of cinnamon,
Nutmeg, each one ounce,
Opium diffused in a sufficient quantity of Spanish white wine, one drachm and a half,
Syrup of red roses boiled to the consistence of honey, two pounds and a quarter.

Reduce the solids to powder; and having mixed them with the opium and syrup, make them into an electuary.

This electuary affords a combination of the more powerful astringents, rendered grateful by aromatics, and having its efficacy, as a remedy in diarrhœa, increased by the opium. It is the basis of the common extemporaneous astringent mixture. One grain of opium is contained in rather more than three drachms.

Electuarium Opiatum. *Opiate Electuary.* Thebaic Electuary.

Take of

Compound powder of cinnamon, six ounces,
Virginian snakeroot in fine powder, three ounces,
Opium diffused in a sufficient quantity of Spanish white wine, half an ounce,
Syrup of ginger, one pound.

Mix them and form an electuary.

This has kept its place in the Pharmacopœias as a substitute for the mithridate and theriaca andromachi; officinal preparations once highly celebrated, but now discarded. Each drachm prepared according to the above formula, contains a grain and a half of opium.

The action which this electuary will produce on the living system, is abundantly apparent from the nature of its ingredients.

CHAPTER XVIII.

TROCHES.

Troches or Lozenges, consist of powders brought to a solid form by the addition of mucilage. When moist, they form a soft paste, in which state they are cut into square or round pieces; and these are hardened by drying. It is a form adapted principally to such medicines as are designed to dissolve slowly in the mouth, and hence, they are always rendered pleasant by the addition of a large proportion of sugar. They are seldom active remedies.

Trochisci Carbonatis Calcis. *Troches of Carbonate of Lime.* Troches of Chalk.

Take of

Prepared carbonate of lime, four ounces,
Gum arabic, one ounce,
Nutmeg, one drachm,
Double refined sugar, six ounces.

Powder them together and form them with water into a mass, which is to be made into troches.

This is a pleasant form under which carbonate of lime may be given as an antacid; and it is useful in diarrhœa.

Trochisci Glycyrrhizæ cum Opio. *Troches of Liquorice with Opium.*

Take of

Opium, two drachms,
Tincture of balsam of tolu, half an ounce,
Simple syrup, eight ounces,
Extract of liquorice, softened in warm water,
Gum arabic in powder, each five ounces.

Grind the opium well with the tincture, then add by degrees the syrup and extract: afterwards gradually

sprinkle upon the mixture the powdered gum arabic. Lastly, dry them so as to form a mass to be made into troches, each weighing ten grains.

These troches are very effectual in relieving the tickling cough frequently attending catarrh. The opium is the active ingredient; the others cover its taste and flavour, and render the composition pleasant, adding at the same time a demulcent quality. One drachm or six grains contain one grain of opium, and from six to twelve may be taken in twenty-four hours.

Trochisci Magnesiæ. *Troches of Magnesia.*

Take of

Magnesia, four ounces,
Double refined sugar, two ounces,
Root of ginger powdered, one scruple.

Triturate them together, and with the addition of the mucilage of gum arabic, make troches.

Magnesia may be conveniently administered, under this form, as an antacid, and at the same time it tends to keep the bowels open.

CHAPTER XIX.

PILLS.

To this form, those drugs are particularly adapted, which in a small dose, and whose nauseous and offensive taste or smell, require them to be concealed from the palate. Pills dissolve the most difficultly in the stomach, and produce the most gradual and lasting effects, of all the internal forms. This is, in some cases, of great advantage; in others, it is a quality not at all desirable; and sometimes, may even be of dangerous consequence, particularly with regard to emetics, which, if they pass the stomach undissolved, and afterwards exert themselves in the intestines, operate there as violent cathartics. Hence emetics are scarce ever given in pills; and hence, to the resinous and difficultly soluble substances, saponaceous ones ought to be added, in order to promote their solution.

Gummy resins, and inspissated juices, are sometimes soft enough to be made into pills, without addition. Where any moisture is requisite, spirit of wine is more proper than syrups and conserves, as it unites more readily with them, and does not sensibly increase their bulk. Light, dry powders require syrups or mucilages, and the more ponderous, as the mercurial and other metallic preparations, thick honey conserve or extracts. Light powders require about half their weight of syrup; or of honey, about three fourths their weight, to reduce them into a due consistence for forming pills. Half a drachm of the mass will make five or six pills of a moderate size.

Gums and inspissated juices, are to be first softened with the liquid prescribed; the powders are then to be added, and the whole beat thoroughly together, until they be perfectly mixed. The masses for pills are best kept in bladders, which should be moistened with some of the same kind of liquid that the mass was made up with, or with some proper aromatic oil.

Pilulæ Aloeticæ. *Aloetic Pills.*

Take of

Gum resin of socotorine aloes in powder,
Soap, equal parts.

Beat them with simple syrup into a mass fit for making pills.

Under this simple form aloes is very commonly exhibited as a cathartic. Two pills are a medium dose.

Pilulæ Aloes et Assæ Fœtidæ. *Pills of Aloes and Assa Fœtida.*

Take of

Gum resin of socotorine aloes in powder,
Gum resin of assa fœtida,
Soap, equal parts.

Form them into a mass with mucilage of gum arabic.

These pills, in doses of about ten grains twice a day, produce the most salutary effects in cases of dyspepsia, attended with flatulence and costiveness.

Pilulæ Aloes et Colocynthidis. *Pills of Aloes and Coloquintida.* Pilulæ Cocciæ.

Take of

Gum resin of socotorine aloes,
..... scammony, each eight parts,
Fruit of coloquintida, four parts,
Volatile oil of cloves,
Sulphate of potass with sulphur, each one part.

Reduce the aloes and scammony into a powder with the salt; then let the fruit of coloquintida, beat into a very fine powder and the oil be added; lastly, make it into a proper mass with the mucilage of gum arabic.

In these pills we have a very useful and active purgative; and where the simple aloetic pill is not sufficient to obviate costiveness, this will often effectually answer the purpose. These pills often produce a copious discharge in cases of obstinate costiveness, when taken to the extent of only five or ten grains; but they may be employed in much larger doses. They are, however, seldom used

with a view of producing proper cathartics. Half a drachm of the mass, contains about five grains of the colocynth, ten of aloes, and ten of scammony.

Pilulæ Aloes et Myrrhæ. *Pills of Aloes and Myrrh.* Rufus's Pills.

Take of

Gum resin of socotorine aloes, two ounces,
Myrrh, one ounce,
Saffron, half an ounce.

Beat them into a mass with a proper quantity of simple syrup.

These pills have long continued in practice, as a stimulating aperient. Given to the quantity of half a drachm or two scruples, they prove considerably cathartic, but they answer much better purposes in smaller doses as laxatives or alteratives. Two or three for a dose.

Pilulæ Assæ Foetidæ Compositæ. *Compound pills of Assa Fœtida.* Gum Pills.

Take of

Gum resin of assa fœtida,
Galbanum,
Myrrh, each eight parts,
Purified oil of amber, one part.

Beat them into a mass with simple syrup.

These pills are designed for anti-hysterics, and emmenagogues, and are very well calculated for answering those intensions. Half a scruple, a scruple, or more, may be taken every night or oftener.

Pilulæ Acetitis Plumbi et Ipecacuanhæ. *Pills of Acetite of Lead and Ipecacuan.*

Take of

Acetite of lead,
Root of Ipecacuan in powder, of each one drachm,
Opium, ten grains.

Beat them with simple syrup into a mass to be divided into forty equal pills.

In most cases of internal hæmorrhage, but more especially in uterine profluvia attended by debility, these pills, taken one every three or four hours, seldom fail to produce the desired astringent effect; and if their use be duly persisted in, will in general induce that salutary change in the system upon which a radical cure depends.

Pilulæ Ammoniareti Cupri. *Pills of Ammoniaret of Copper.* Copper Pills.

Take of

Ammoniaret of copper in fine powder, sixteen grains,
Bread crumb, four scruples,
Solution of carbonate of ammonia, as much as may be sufficient.

Beat them into a mass, to be divided into thirty-two equal pills.

It is under this form that ammoniaret of copper is given in epilepsy and the other spasmodic diseases in which it has been employed. Half a grain of it is contained in each pill. One pill is given at first, night and morning, and the dose is gradually increased.

Pilulæ Hydrargyri. *Pills of Quicksilver.* Mercurial Pills.

Take of

Purified quicksilver,
Conserve of red roses, each one ounce,
Starch, two ounces,

Triturate the quicksilver with the conserve, in a glass mortar, till the globules completely disappear, adding occasionally a little mucilage of gum arabic; then add the starch, and beat the whole with water into a mass, which is immediately to be divided into four hundred and eighty equal pills.

The common mercurial pill is one of the best preparations of mercury, and may in general supersede most other forms of this medicine. In its preparation the mercury is minutely divided, and probably converted into the black oxide. To effect its mechanical division, it must be triturated with some viscid substance. Soap,

resin of guaiac, honey, extract of liquorice, manna, and conserve of roses, have all been at different times recommended, and either of them may be employed.

We learn when the mercury is completely extinguished, most easily, by rubbing a very little of the mass with the point of the finger on a piece of paper, if no globules appear. As soon as this is the case, it is necessary to mix with the mass a proportion of powder of liquorice or starch, to give it a proper degree of consistency. It is necessary to form the mass into pills immediately, as it soon becomes hard. While this preparation of mercury is much milder in its operation than some others, it is perhaps capable of answering every purpose which the remedy can serve. The common dose, given with the view of inducing the common mercurial action, is two pills at bed time, and one in the morning, which in particular cases and habits, require to be increased. Four, or six pills given at once, generally excite purging. Each pill contains one grain of quicksilver.

Pilulæ Opiatæ. *Pills of Opium.* Thebaic Pills.

Take of

Opium, one part,
Extract of liquorice, seven parts,
Jamaica pepper, two parts.

Soften the opium and extract separately, with diluted alcohol, and having beat them into a pulp, mix them; then add the pepper reduced to powder; and lastly, having beat them well together, form the whole into a mass.

This affords a form under which the exhibition of opium may be concealed from the patient. Two pills or ten grains of the mass contain one grain of opium. In the formula of the London College, the aromatic is omitted, and the proportion of opium increased; so that each pill contains one grain.

Some complain that the extract of liquorice occasions the mass to become too hard and difficult to manage. The following formula, therefore, may be substituted, or a stronger preparation: viz.

Take of

Castile soap, eight parts,
Camphor, six parts,
Opium, four parts.

The several articles being separately powdered, mix and beat them into a mass.

Pilulæ Rhei Compositæ. *Compound Pills of Rhubarb.* Stomachic Pills.

Take of

Root of rhubarb in powder, one ounce,
Gum resin of socotorine aloes, six drachms,
Myrrh, half an ounce,
Volatile oil of peppermint, half a drachm.

Make them into a mass with a sufficient quantity of syrup of orange peel.

This is a moderate laxative much employed, especially in dyspeptic affections, to obviate costiveness, and gently stimulate the stomach and intestines. Two pills are taken at bed time.

Pilulæ Scilliticæ. *Squill Pills.*

Take of

Dried root of squills in fine powder, one scruple,
Ammoniacum,
Lesser cardamom seeds in powder,
Extract of liquorice, each one drachm.

Mix and form them into a mass with simple syrup.

This is an elegant and commodious form for the exhibition of squills, whether for promoting expectoration, or with the other intentions to which that medicine is applied. As the virtues of the compound is derived chiefly from the squills, the other ingredients are often varied in extemporaneous prescriptions. If, however, the above form should be found to be too hard and difficult to manage, the following formula may be prefered: viz.

Take of

Dried root of squills in fine powder,
Gum ammoniacum, each one drachm,
Castile soap, one ounce.

Mix them into a mass with a sufficient quantity of balsam copaiva.

Pilulæ Plummeri. *Plummer's Pills.*

Take of

Precipitated sulphur of antimony,
Mild muriate of mercury, each three drachms,
Extract of gentian,
Hard Spanish soap, each one drachm.

Let the mercury be triturated with the sulphur; then add the extract, and form a mass with jelly of soap.

These pills were recommended to the attention of the public, about forty years since, by Dr. Plummer, whose name they long bore. He represented them in a paper, which he published in the Edinburgh Medical Essays, as a very useful alterative; and on his authority they were at one time much employed. In some cutaneous and even venereal affections, they are yet in repute, as being an efficacious remedy in doses of from four to eight or ten grains, morning and night.

Pilulæ Gambogiæ Compositæ. *Compound Gamboge Pills.* (Lond. Pharm.)

Take of

Gamboge in powder,
Socotorine aloes in powder,
Compound powder of cinnamon, of each, one drachm,
Soap, two drachms.

Mix the powders together, then, adding the soap, beat the whole into one mass.

By the addition of the gamboge to the aloes, its cathartic power is increased, and a composition afforded, more active than the aloetic pill. Two or three pills are a proper dose.

Pilulæ Ferri cum Myrrha. *Pills of Iron with Myrrh.* (Lond. Pharm.)

Take of

Myrrh, beat to powder, two drachms,
Sub-carbonate of soda,
Sulphate of iron,
Sugar, of each a drachm.

Triturate the myrrh with the subcarbonate of soda; then, having added the sulphate of iron, triturate them again; lastly, beat the whole together, until they form an uniform mass.

This is the same composition, with regard to the active ingredients, as forms the basis of the compound mixture of iron, the substitute for Griffith's mixture, and it may be occasionally convenient to prescribe it under the form of pill, or to form the mixture from it extemporaneously by diffusion in water.

CHAPTER XX.

CATAPLASMS.

By cataplasms, are in general understood, those external applications, which are brought to a due consistence or form for being properly applied, not by means of oily and fatty matters, but by water or watery fluids. Of these, not a few are had recourse to in actual practice; but they are seldom prepared in the shop of the apothecary, and, in some of the best modern Pharmacopœias, no formula of this kind are introduced. The London and Dublin Colleges, however, although they have abridged the number of cataplasms, still retain a few; and it is not without some advantage that there are fixed forms for the preparation of them.

Cataplasma Lini. *Linseed Poultice.*

Take of

Linseed in powder, half a pound.
Hot water, one pound and a half.

The powder is to be gradually sprinkled into the hot water, while they are quickly blended together with a spoon.

Poultices are commonly made too thin, by which means the least pressure, or their own gravity remove them from the part; they should be thick enough to support a certain form when applied. This is the best and the most convenient of all the emollient poultices for common cases, and may in a great measure supersede the bread and milk one so much in use formerly, and which is so liable to become brittle when dried. The mucilage of the slippery elm bark will also be found an excellent application of this kind for most of the purposes required.

Cataplasma Dauci. *Carrot Poultice.*

Bruise the fresh carrots in a mortar into a pulp, or the carrots may be first boiled.

The carrot poultice is employed as an application to ulcerated cancers, scrofulous sores of an irritable kind, and to various malignant inveterate ulcers.

Cataplasma Fermenti. *Fermenting Poultice.*

Take of

Flour, a pound,
Yeast of beer, half a pint.

Mix them, and apply a gentle heat until the mixture begins to rise.

The yeast mixed with the flour, and aided by the heat applied, soon excites fermentation, and the cataplasm in this state has been applied with much advantage as an anodyne in painful and irritable sores, and as an antiseptic in ulceration with fœtor. Its efficacy appears to depend on the carbonic acid gas evolved by the fermentative process.

Cataplasma Aluminis. *Cataplasm of Alum.* Alum Curd.

Take the whites of two eggs; agitate them with a piece of alum, until a coagulum be formed.

This preparation taken from Riverius, is a useful astringent epithem for sore moist eyes. Where the complaint is violent, this preparation, after the inflammation has subsided a little to bleeding, is one of the best external remedies. It is to be spread upon lint and applied at bed time.

Cataplasma Sinapeos. *Mustard Cataplasm.*

Take of

Mustard, in powder,
Crumb of bread, of each, half a pound,
Vinegar, as much as is sufficient.

Mix and make a cataplasm.

Cataplasms of this kind, are commonly known by the name of sinapisms. They were formerly, frequently prepared in a more complicated state, containing garlic, black soap, and other similar articles. But the above simple form will answer every purpose which they are capable of accomplishing. They are employed only as stimulants; they often inflame the part, and raise blisters; but not so perfectly as cantharides. Their chief advantage depends upon the suddenness of their action.

This preparation is the common sinapism which is applied with advantage, as a powerful stimulant, to the soles of the feet in typhus, where there is a determination to the head, and in comatose affections.

CHAPTER XXI.

LINIMENTS, OINTMENTS, CERATES, AND PLASTERS.

These are all combinations of fixed oil, or animal fat, with other substances, and differ from each other only in consistence. A liniment is of the consistence of thin honey; an ointment is firmer; and a cerate still harder. Oil or lard is their common basis; the due consistence is given by wax or spermaceti, and to the composition may be added any substance which is to be used under this form. *Plasters* are the most solid, and when cold, should be firm, and should not adhere to the fingers, but when gently heated, should become sufficiently soft to spread easily, and should then adhere to the skin. Plasters derive their firmness, either from a large proportion of wax, or from the presence of some metallic oxide, such as that of lead. The following general directions are given in the Edinburgh Pharmacopœia for their preparation.

In making these compositions, the fatty and resinous substances are to be melted with a gentle heat, and then constantly stirred, adding at the same time the dry ingredients, if there be any, until the mixture on cooling become stiff.

Linimentum Simplex. *Simple Liniment.*

Take of

Olive oil, four parts,
White wax, one part.

Unguentum Simplex. *Simple Ointment.*

Take of

Olive oil, five parts,
White wax, two parts.

Unguentum Physeteris Macro Cephali Sevi. *Ointment of Spermaceti.*

Take of

Spermaceti, two parts,
Olive oil,
White wax, each one part.

Melt them together over a slow fire, stirring them constantly and briskly until they be cold.

These several compositions differ merely in consistence. They are useful cooling ointments for excoriations and other frettings, and for softening the skin and healing chaps. They are also applied spread on linen as usual dressings to slight wounds and simple ulcers. Frequently they are employed as the basis of more compounded ointments.

Linimentum Hydrargyri Compositum. *Compound Liniment of Quicksilver.* (Lond. Pharm.)

Take of

The strong mercurial ointment,
Prepared lard, of each four ounces,
Camphor, one ounce,
Rectified spirit of wine (alcohol) two fluidrachms,
Water of ammonia, four fluid ounces.

Rub the camphor first with the spirit, then with the lard and mercurial ointment, lastly adding gradually the water of ammonia, mix the whole together.

This is designed as a stimulating application and discutient, to be applied to indolent tumors or collections of fluid, a truly excellent formula for all cases in which the object is to quicken the action of the absorbents, and gently stimulate the surface of parts. It is a capital application for diminishing the indurated state of particular muscles, a peculiar affection every now and then met with in practice; and it is particularly well calculated for lessening the stiffness and chronic thickening often noticed in the joints.

Unguentum Oxidi Plumbi Albi. *Ointment of White Oxide of Lead.* White Ointment.

Take of

Simple ointment, five parts,
White oxide of lead, one part.

Or, the oxide may be added in the same proportion to the spermaceti ointment, its firmer consistence being better adapted to the purpose of keeping the oxide uniformly suspended.

This is a cooling desiccative ointment of great use when applied to excoriated surfaces; and has been a common application to burns and superficial inflammation.

Unguentum Acetitis Plumbi. *Ointment of Acetite of Lead.* Saturnine Ointment.

Take of

Simple ointment, twenty parts,
Acetite of lead, one part.

This is an excellent cooling ointment, and of the greatest use in many cases. It is applied to the same purposes as the preceding, and is more frequently employed.

Ceratum Lithargyri Acetati Compositum. *Compound Cerate of Acetated Litharge.* Goulard's Cerate.

Take of

Water of acetated litharge, two ounces and a half,
Yellow wax, four ounces,
Olive oil, nine ounces,
Camphor, half a drachm.

Rub the camphor with a little of the oil. Melt the wax with the remaining oil, and as soon as the mixture begins to thicken, pour in by degrees the water of acetated litharge, and stir constantly until it be cold; then mix in the camphor previously rubbed with oil.

This ointment, usually named *Goulard's cerate*, has been rendered famous by the recommendations of Mr. Goulard, a French surgeon. It is unquestionably in many cases very useful; it cannot, however, be considered as

varying essentially from the saturnine ointments already mentioned. It is employed with nearly the same intentions, and differs from them chiefly in consistence.

Unguentum Rosarum. *Ointment of Roses.*

Take of

Hog's lard,
Fresh damask roses with their calices, each equal parts.

Let the roses be slightly bruised in a marble mortar with a pestle of wood, and put them in a vessel with the lard; place this over a gentle fire, so as to evaporate a great part of the moisture; then press it through linen and suffer it to cool. Separate the feces which are on the top, and melt it in order to depurate.

Unguentum Aquæ Rosæ. *Ointment of Rose Water.*

Take of

Oil of sweet almonds, two ounces,
Spermaceti, half an ounce,
White wax, one drachm.

Melt the whole in a water bath, stirring it frequently; when melted, add of

Damask rose water, two ounces,

and stir the mixture continually till it is cold.

These more elegant compositions being similar in their properties to the preceding, are used for the same purposes.

Unguentum Stramonii. *Ointment of Thorn Apple.*

Take of

Leaves of thorn apple recently gathered and sliced, five pounds,
Hog's lard, fourteen pounds.

Let them simmer together over a gentle fire till the leaves become crisp and dry. Then press out the lard, return it into the vessel when cleansed, and add to every pound of the compound, of

Yellow wax, two ounces.

Set the whole on the fire; when the wax has melted remove the vessel, and let it rest while the contents gradually cool, that the impurities may subside. These must then be separated from the ointment.

This ointment has been found to afford relief in external inflammations, and hæmorrhoids. It is also highly beneficial in burns, and to allay the swelling of a cow's udder.

Unguentum Resinosum. *Resinous Ointment.* Basilicon Ointment.

Take of

Hog's lard, eight parts,
Resin of pine, five parts,
Yellow wax, two parts:—Or

Take of

Yellow resin,
..... wax,
Hog's lard,
Oil of olives, equal weights.

This ointment, long known under the name of yellow basilicon, is commonly employed in dressing, for digesting, cleansing, and incarning wounds and ulcers.

Unguentum Picis. *Tar Ointment.*

Take of

Tar, five parts,
Yellow wax, two parts.

Equal parts of tar and mutton suet are prefered by some as forming an ointment of a more firm consistence. The two compositions, however, cannot be considered as differing essentially from each other. As far as they have any peculiar activity, this entirely depends on the tar. From the empyreumatic oil and saline matters which it contains, it is undoubtedly of some activity. Accordingly it has been successfully employed against foul ulcers, and some cutaneous affections, particularly tinea capitis.

Unguentum Infusi Meloes Vesicatorii. *Ointment of Infusion of Cantharides.* Mild Epispastic Ointment.

Take of

Cantharides,
Resin of pine,
Yellow wax, each one part,
Hog's lard,
Venice turpentine, each two parts,
Boiling water, four parts.

Infuse the cantharides in the water for a night; then strongly press out and strain the liquor and boil it with the lard till the water be consumed; then add the resin and wax, and when these are melted, take the ointment off the fire and add the turpentine.

This ointment, containing the soluble parts of the cantharides, uniformly blended with other ingredients, are more commodious, and in general occasion less pain, though little less effectual in their action, than the compositions with the fly in substance.

Unguentum Pulveris Meloes Vesicatorii. *Ointment of the Powder of Cantharides.* Strong Epispastic Ointment.

Take of

Resinous ointment seven parts,
Powdered cantharides, one part.

This ointment is employed in the dressings for blisters, intended to be made perpetual, as they are called, or to be kept running for a considerable time; which in many chronic, and acute diseases, is of great service. Particular care should be taken, that the cantharides employed in these compositions, be reduced into a very subtle powder, and that the mixtures be made as equal and uniform as possible.

Unguentum Sulphuris. *Sulphur Ointment.* Antisporic Ointment.

Take of

Hog's lard, two parts,
Sublimed sulphur, one part.

To each pound of this ointment, add of
Volatile oil of lemons, or
..... of lavender, half a drachm.

Sulphur is a certain remedy for the itch, more safe than mercury. A pound of this ointment serves for four unctions. The patient is to be rubbed every night, a fourth part of the body each time. Though the disease may be thus cured by a single application, it is in general advisable to touch the parts most affected for a few nights longer, and to conjoin the internal use of sulpur.

Unguentum Acidi Nitrosi. *Ointment of Nitrous Acid.*

Take of
Hog's lard, one pound,
Nitrous acid, six drachms.

Mix the acid gradually with the melted lard, and diligently beat the mixture as it cools.

The axunge in this ointment seems to be oxidized; for, during the action of the acid upon it, there is a great deal of nitric oxide gas disengaged. It acquires a yellowish colour, and a firmer consistency; and forms an excellent and cheap substitute, in slight herpetic and other cutaneous affections, for the ointment of nitrate of mercury.

Unguentum Hydrargyri. *Ointment of Quicksilver.* Strong Mercurial Ointment.

Take of
Quicksilver,
Hog's lard, each three parts,
Mutton suet, one part.

Rub the quicksilver carefully in a mortar with a little of the hog's lard, until the globules entirely disappear; then add the remainder of the lard and the suet, rubbing them well together.

Unguentum Hydrargyri Mitius. *Mild Ointment of Quicksilver.* Blue Ointment.

This is to be prepared as the preceding ointment, excepting that only one part of quicksilver is to be employed.

During the trituration of mercury with unctuous matter, it cannot be doubted that an oxidation of the metal is effected; and the efficacy of the ointment depends, in a great measure, on this oxide of mercury. It has been also supposed, with a sufficient probability, that the portion of sebacic acid formed in animal fat, when exposed to the air, may promote this oxidation, and combine with the oxide; and the improvement of the ointment on keeping, a fact long observed, is probably owing to the gradual formation of this sebate of mercury.

Mercurial ointment, is the form by which mercury is introduced into the system by external friction. It is a mode employed with advantage, in cases where the preparations administered internally, are liable to be too much determined to the intestines, so as to occasion griping and purging, and when it is necessary to introduce a large quantity of mercury speedily into the system; likewise in some local affections, particularly bubo. One drachm of the strong ointment, (that containing equal parts of the mercury and lard,) is introduced by friction in the evening, and frequently in the morning, until the system be affected. The inside of the thighs and legs, are the parts most suitable for the application of the frictions. But it is frequently necessary to change the place, as even the mildest ointment is sometimes apt to excite topical inflammation, and render further application very inconvenient. It is requisite that the ointment should be prepared with very great care; for, upon the degree of triture which has been employed, the activity of the mercury very much depends.

Several expedients have been contrived to facilitate the extinction of the mercurial globules by trituration; the most of these, however, are inadmissible. If sulphur be used, it will probably render the mercury inactive, and turpentine renders the ointment so acrid, that when applied by friction it produces irritation on the skin, or inflammation. Rancid fat, it has been found, extinguishes the quicksilver better than recent fat, and by the action of the metal the rancidity of the fat appears to be corrected. If the trituration be made at first with a little tallow, as being a harder substance than fat, the operation may be completed without much difficulty.

Half a drachm of camphor, added to one ounce of strong mercurial ointment, is much recommended to be rubbed on thickened, indurated parts, with a view of ex-

citing the action of the absorbents. Rubbed along the course of the urethra, it is very serviceable in diminishing and removing chordee.

UNGUENTUM OXIDI HYDRARGYRI CINEREI. *Ointment of Gray Oxide of Quicksilver.*

Take of

Gray oxide of quicksilver, one part,
Hog's lard, three parts.

This is designed as a substitute for the mercurial ointment, and as the quicksilver is fully oxidized, it has been supposed that it will prove more active. If this were sufficiently established, the facility and certainty of its preparation would be attended with great advantages.

UNGUENTUM SUB-MURIATIS HYDRARGYRI ET AMMONIÆ. *Ointment of Submuriate of Quicksilver and Ammonia.*

Take of

Submuriate of quicksilver and ammonia, one drachm,
Ointment of roses, one ounce and a half.

Let them be mixed very intimately.

This is a very elegant mercurial ointment, and is frequently made use of in the cure of obstinate cutaneous affections.

UNGUENTUM OXIDI HYDRARGYRI RUBRI. *Ointment of Red Oxide of Quicksilver.*

Take of

Red oxide of quicksilver by nitrous acid, one part,
Hog's lard, eight parts.

This is an excellent stimulating ointment, often of very great service in indolent, ill conditioned sores, when we wish to excite them to greater action. If it prove too stimulating, it may be weakened with axunge; and in this state, it is often applied to the eye-lids, in chronic ophthalmia.

UNGUENTUM NITRATIS HYDRARGYRI. *Ointment of Nitrate of Quicksilver.* Yellow Ointment.

Take of

Purified quicksilver, one part,
Nitrous acid, two parts,
Hog's lard, three parts,
Olive oil, nine parts.

Dissolve the quicksilver in the nitrous acid, by digestion in a sand heat, and, while the solution is hot, mix with it the lard and oil, previously melted together, and just beginning to grow stiff. Stir them briskly together in a glass or wedgewood mortar, so as to form the whole into an ointment.

In this ointment, the nitrate of the quicksilver combines with the lard; and as there is also an excess of nitric acid, it acts chemically on the fat, and gives to the composition a very firm consistence. It is a very active ointment, and as such, it is frequently employed with success in cutaneous and other topical affections, a small quantity being rubbed on the part.

UNGUENTUM NITRATIS HYDRARGYRI MITIUS. *Milder Ointment of Nitrate of Quicksilver.*

This is prepared in the same manner as the preceding, with a triple quantity of hog's lard, and olive oil. It is, of course, a much milder application, and is designed to be also of a softer consistence; but, to obtain the latter convenience, it is better to reduce the strong ointment, with the requisite proportion of lard.

UNGUENTUM SUB-ACETITIS CUPRI. *Ointment of Sub-Acetite of Copper.* Ointment of Verdigris.

Take of

Resinous ointment, fifteen parts,
Sub-acetite of copper, one part.

This ointment is used for cleansing sores, and keeping down fungous flesh. Where ulcers continue to run from a weakness of the vessels of the parts, the tonic powers of the copper promise considerable advantage. It is also frequently used with advantage in cases of ophthalmia,

depending on scrofula, where the palpebræ are principally affected; but, when it is to be thus applied, it is in general requisite that it should be somewhat weakened, by the addition of a proportion of simple ointment of hog's lard.

Unguentum Oxidi Zinci Impuri. *Ointment of Impure Oxide of Zinc.* Ointment of Tutty.

Take of

Simple liniment, five parts,
Prepared impure oxide of zinc, one part.

This and the following ointment are chiefly used in affections of the eye, particularly in those cases where redness arises rather from relaxation than from active inflammation.

Unguentum Oxidi Zinci. *Ointment of Oxide of Zinc.*

Take of

Simple liniment, six parts,
Oxide of zinc, one part.

Ceratum Simplex. *Simple Cerate.*

Take of

Olive oil, six parts,
White wax, three parts,
Spermaceti, one part.

This differs from the simple ointment, in containing a greater proportion of wax to the oil, and in the addition of the spermaceti. But by these means, it obtains only a more firm consistence, without any essential change of properties.

Ceratum Carbonatis Zinci Impuri. *Cerate of Impure Carbonate of Zinc.* Turner's Cerate.

Take of

Simple cerate, five parts,
Prepared impure carbonate of zinc, one part:

—Or,

Take of

Olive oil, two pounds,
Yellow wax,

Prepared impure carbonate of zinc, each one pound.

This composition is formed upon that which was formerly called *Turner's cerate*. The inventor strongly recommends it in cutaneous ulcerations and excoriations. It appears, from experience, to be an excellent epulotic, and as such, is frequently made use of in practice.

Ceratum Sabinæ. *Savine Cerate.*

Take of

Fresh leaves of cedar savine, bruised, two pounds,
Yellow wax, one pound,
Hog's lard, four pounds.

Boil the leaves of the savine with the lard and wax melted together till they become crisp, and while hot strain the mixture through a coarse cloth. It is sometimes prepared from the leaves, reduced to fine powder, and mixed with lard.

The ceratum sabinæ (see juniperus virginiana) is designed as an irritating application with the view of exciting a perpetual discharge from blisters as a remedy in chronic diseases of the joints, &c. and in other cases where such discharge is required. It is an admirable preparation of that shrub, and has been found by experience to answer every purpose for which it was originally suggested by Dr. Crowther. On the use of this cerate, immediately after the cuticle raised by the blister is removed, it should be remarked, that experience has proved the advantage of using the application lowered by half or two thirds of the unguentum ceræ: an attention to this direction will produce less irritation and more discharge, than if the savine cerate is used in its full strength. But as the discharge diminishes, the strength of the savine dressing should be proportionally increased.

Emplastrum Simplex. *Simple Plaster.*

Take of

Yellow wax, three parts,
Mutton suet,
Resin of pine, each two parts.

The principal use of this plaster is as a dressing, when spread thin on linen, to the part to which a blister has been applied.

Emplastrum Resinosum Compositum. *Compound Resinous Plaster.*

Take of

Burgundy pitch, two pounds,
Galbanum, one pound,
Resin of pine,
Yellow wax, each four ounces,
Fixed oil of mace, one ounce.

To the pitch, resin and wax melted together, add first the galbanum and then the oil of mace.

This plaster has been applied to the region of the stomach, as a stimulus, to relieve nausea and vomiting, and is considered as the most elegant formula of the kind.

Emplastrum Meloes Vesicatorii. *Plaster of Spanish Flies.* Blistering Plaster.

Take of

Mutton suet,
Yellow wax,
Resin of pine,
Cantharides, each equal weights.

Beat the cantharides into a fine powder, and add them to the other ingredients previously melted and removed from the fire.

This is the plaster usually employed to raise a blister. It is of a softer consistence than the other plasters, that it may admit of being spread without the assistance of heat, which would impair the acrid quality of the cantharides. It requires to be applied twelve hours to produce a perfect blister; it is then removed; the vesicle is cut, and the inflamed surface dressed with simple cerate or plaster.

Emplastrum Meloes Vesicatorii Compositum. *Compound Plaster of Spanish Flies.*

Take of

Venice turpentine, eighteen parts,
Burgundy pitch,
Cantharides, each twelve parts,
Yellow wax, four parts,

Sub-acetite of copper, two parts,
Mustard seed,
Black pepper, each one part.

Having first melted the pitch and wax, add the turpentine, and to these in fusion, and still hot, add the other ingredients, reduced to a fine powder and mixed, and stir the whole carefully together, so as to form a plaster.

It occasionally happens, that the common plaster of cantharides is insufficient to excite a blister, even when its surface has been sprinkled over with powdered cantharides. In such cases, or even in others, where it is necessary that a blister should be quickly raised, this more powerful composition may be employed. It certainly contains a sufficient variety of stimulating ingredients, and its operation is accompanied with a pungent sensation of heat.

EMPLASTRUM OXIDI PLUMBI SEMIVITREI. *Plaster of the Semi-Vitrified Oxide of Lead.* Common Plaster.

Take of

Semi-vitrified oxide of lead, one part,
Olive oil, two parts.

Boil them, adding water, and constantly stirring the mixture till the oil and oxide be formed into a plaster.

Oxides of lead, boiled with oils, unite with them into a plaster of an excellent consistence, and which makes a proper basis for several other plasters.

In the boiling of these compositions, a quantity of water must be added to prevent the plaster from burning and growing black. Such water as it may be necessary to add during the boiling, must be previously made hot; for cold liquor would not only prolong the process, but likewise occasion the matter to explode, and be thrown about with violence, to the great danger of the operator. This accident will equally happen upon the addition of hot water, if the plaster be extremely hot. It is therefore better to remove it from the fire a little, before each addition of water. This plaster, which has long been known under the name of *diachylon*, is a common application in excoriations of the skin, slight fresh wounds, and the like. They keep the part soft, and somewhat warm, and defend it from the air, which is all that can be expected in these cases, from any plasters.

Emplastrum Resinosum. *Resinous Plaster.* Adhesive Plaster.

Take of

Plaster of semi-vitrified oxide of lead,
Resin of pine, equal weights.

This plaster rendered more adhesive, and somewhat stimulating, by this intermixture of resin, is used for keeping on other dressings, for retaining the edges of recent wounds together, when we are endeavouring to secure them by the first intention, and for giving mechanical support to new flesh, and contracting the size of ulcers in the manner recommended by Mr. Baynton, for the cure of ulcers of the legs.

Emplastrum Assæ Foetidæ. *Plaster of Assa Fœtida.* Anti-Hysteric Plaster.

Take of

Plaster of semi-vitrified oxide of lead,
Gum resin of assa fœtida, each two parts,
Galbanum,
Yellow wax, each one part.

As an application to the umbilical region, or over the whole abdomen, in hysteric cases, this plaster has sometimes produced good effects. But probably more from its giving an additional degree of heat to the part, than from any influence, derived from the fetid gums.

Emplastrum Gummosum. *Gum Plaster.*

Take of

Plaster of semi-vitrified oxide of lead, eight parts,
Ammoniacum,
Galbanum,
Yellow wax, each one part :—Or,

The following form is prefered by some for the same purposes.

Take of

Plaster of semi-vitrified oxide of lead, three pounds,
Strained galbanum, half a pound,

Common turpentine,
Frankincense, each three ounces.

Melt the three first articles together, and add the last in powder; stir them well together.

This plaster is used as a digestive and suppurative; particularly in abscesses, after a part of the matter has been maturated and discharged, for suppurating or discussing the remaining hurt part; but it is very doubtful whether it derives any advantage from the gums entering its composition.

Emplastrum Saponaceum. *Saponaceous Plaster.*

Take of

Plaster of semi-vitrified oxide of lead, four parts,
Gum plaster, two parts,
Soap sliced, one part.

To the plasters melted together, add the soap; then boil for a little while so as to form a plaster.

This is likewise supposed to possess a discutient quality, but is much inferior to the mercurial plaster, and is scarcely ever used.

Emplastrum Hydrargyri. *Plaster of Quicksilver.* Blue Plaster.

Take of

Olive oil,
Resin of pine, each one part,
Quicksilver, three parts,
Plaster of semi-vitrified oxide of lead, six parts.

Melt the oil and resin together, and when this mixture is cold let the quicksilver be rubbed with it till the globules disappear; then add by degrees the plaster of semi-vitrified oxide of lead melted, and let the whole be accurately mixed.

This mercurial plaster is considered as a powerful resolvent and discutient, acting with much greater certainty for these intentions than any composition of vegetables alone. Pains in the joints and limbs from a venereal cause, nodes, tophi, and beginning indurations are said sometimes to yield to its application.

EMPLASTRUM OXIDI FERRI RUBRI. *Plaster of Red Oxide of Iron.* Strengthening Plaster.

Take of

Plaster of semi-vitrified oxide of lead, twenty-four parts,
Resin of pine, six parts,
Yellow wax,
Olive oil, each three parts,
Red oxide of iron, eight parts.

Grind the red oxide of iron with the oil, and then add it to the other ingredients, previously melted.

This plaster spread on leather is used as the common strengthening plaster in weaknesses of the large muscles, as of the loins; and its effects seem to proceed from the artificial mechanical support given to the part, which may also be done by any other plaster that adheres with equal firmness.

APPENDIX.

No. I.

OF MINERAL WATERS.

The chemical analysis of mineral waters is of considerable importance, as determining the principles in which their active powers reside, and thus enabling the physician to employ them with more advantage and discrimination. Mineral waters include all such fluids as are naturally impregnated with heterogeneous matter, which they have dissolved within the bowels of the earth, whether sulphureous, metallic, or saline; and as many of these are successfully employed in medicine, they have received the appellation of medicinal waters. They derive their peculiarity of character in general either from containing carbonic acid, or soda not neutralized, sulphuretted hydrogen, purging salts, earthy salts, or iron; or from their temperature exceeding in a greater or less degree that of the atmosphere. These waters have also a specification depending on the foreign substances which they contain. Waters impregnated with free carbonic acid gas sparkle when drawn from the spring, or poured into a glass; they have a taste more or less pungent and acidulous, but soon become vapid from exposure to the air. Along with the carbonic acid, there generally are present portions of saline, earthy or metallic matter, chiefly carbonates of lime, magnesia, and iron. The quantity of carbonic acid contained in the mineral waters is very various. When highly impregnated with *carbonic acid gas*, they are grateful from their pungency, sit light on the stomach, and in a large dose produce even sensibly a degree of exhilaration; they increase the appetite, and generally have a diuretic effect. They prove useful in dyspeptic affections, from the grateful and mode-

rate stimulus exerted by the carbonic acid on the stomach, aided by the diluent operation of the water; and hence the advantage derived from them in the numerous chronic affections connected with impaired power of the digestive organs. They generally also contain some saline substances which communicate additional powers, and the operation of these is usually promoted, or at least they are rendered more grateful by the carbonic acid. Those which contain carbonate of soda, as Seltzer water, prove more powerfully diuretic, and are employed with advantage as palliatives in urinary calculus, and in the painful discharge of urine from other affections of the urinary organs. Those waters impregnated with iron are more particularly employed in those diseases in which that metal is employed.

The *sulphureous mineral waters* owe their distinguishing character to an impregnation of sulphuretted hydrogen, and they are at once recognized by their peculiar fœtid smell. They almost uniformly contain saline substances which modify their powers. From the action of the sulphuretted hydrogen, they are employed more particularly in cutaneous affections; and from the combined action of this and the saline matter which generally has a purgative effect, they are farther used in diseases of the digestive organs, dyspepsia, hypochondriasis, torpor of the intestines, and visceral obstructions; and also in scrofulous affections. They are also applied locally in cutaneous eruptions, and the warm sulphurous baths have been in particular celebrated for their efficacy under this form of application.

The *saline mineral waters* comprise those in which, without any large proportion of aerial matter, various saline compounds, generally neutral, exist. The salts most usually present are sulphates, muriates, and carbonates; and the bases with which the acids forming these are combined, are soda, magnesia, and lime. These waters are usually aperient, the substances which they hold dissolved being either so far as can be determined inert, such as the sulphate and carbonate of lime; or being cathartic, as the greater number of the other compound salts. It has always been remarked too with regard to them, that their cathartic power is greater than could be supposed from the extent of their saline impregnation as determined by analysis; a proof of the influence of dilution in the operation of mineral waters. They are

usually employed in diseases, where it is of advantage to stimulate the digestive system, the intestinal canal, and the secreting organs connected with it, or where advantage is derived from moderate and continued evacuations. Hence their celebrity in the treatment of some forms of dyspepsia and hypochondriasis, chlorosis, chronic hepatitis, jaundice, and in scrofula.

When these waters are impregnated with carbonic acid, which they frequently are, they become more grateful, and sit easier on the stomach. When they have an impregnation of iron, they acquire tonic powers, and more efficacy as remedies in amenorrhœa and the other chronic diseases in which this metal is employed.

Sea water, in strict chemical arrangement, must be regarded as belonging to the class of saline mineral waters, as it holds dissolved merely various neutral salts, chiefly muriate of soda and of magnesia, and sulphate of soda and magnesia with a little sulphate of lime. It much exceeds, however, in the extent of impregnation, any common mineral water. Its medicinal powers are similar to those of the saline mineral waters; from the extent of its saline impregnation it is more active as a cathartic, and this renders it more stimulating than fresh water as a bath.

Chalybeate mineral waters owe their characteristic properties chemically and medicinally to an impregnation of iron. The oxide of iron is almost uniformly held dissolved by carbonic acid, the acid being usually in excess; in a few mineral waters, sulphate of iron is present; but these are rare, and are in general too active to be well adapted to medicinal use. Chalybeate waters have a peculiar styptic taste; they are transparent when taken from the spring, but when exposed for some time to the air, a pellicle forms on the surface, and a quantity generally minute of ochrey sediment subsides, the water at the same time losing its taste. This change is accelerated by heat.

Chalybeate mineral waters are remedies of considerable activity and power. They act as tonics, increasing the strength of the system, raising the force of the circulation, giving tone to the digestive organs, augmenting muscular vigour, and promoting the excretions. They are of course employed in those diseases in which iron is principally used, amenorrhœa, chlorosis, some states of menorrhagia, leucorrhœa, dyspepsia, scrofula, and vari-

ous forms of chronic debility. And as iron always succeeds best when given in small doses, and in a state of considerable dilution, the chalybeate waters afford the best form under which it can be prescribed, that which is at once attended with least irritation, and from which the greatest benefit is obtained. The powers of these waters, too, are often aided by the presence of other ingredients. The impregnation of carbonic acid, when it is present in excess, gives them a grateful stimulant quality, which is exerted on the stomach; and saline substances communicate to them an aperient power.

It would be foreign to the object of this sketch to attempt a particular history connected with the various celebrated mineral springs, so much resorted to on the European continent, but some account of the principles and medicinal properties of those of our own country cannot fail of being acceptable, since the most serious consequences frequently result from an indiscriminate employment of these waters.

The Ballston Mineral Waters are those most celebrated in the United States, and the following is the result of their analysis, by an eminent French chemist.

1.	Carbonic acid, three times its volume.	
2.	Muriate of soda,	31 grains.
3.	Super-saturated carbonate of chalk,	22 grains.
4.	Muriate of magnesia,	12½ grains.
5.	Muriate of chalk,	5 grains.
6.	Carbonate of iron,	4 grains.

To the preceding analysis, published in an excellent periodical work, the American Medical and Philosophical Register, Professor Hosack, of New York, has subjoined some valuable "Observations on the use of the Ballston mineral waters in various diseases."

"The Ballston waters have been long known to yield a great quantity of *fixed air*, and to hold in solution a large portion of *iron*. By the analysis refered to, it appears that they yield a much larger proportion of fixed air, and that they contain a greater quantity of iron, than any other mineral water that has hitherto been discovered, not excepting that of Vichy, one of the strongest chalybeate waters in Europe. But it appears, that they also contain another substance, viz. the *muriate of lime*, which, with the other ingredients with which it is associated, promises to be of great and extensive utility.

"We are accordingly from this analysis induced to ascribe more virtues to the Ballston waters than physicians have generally believed them to possess. Although much is due to exercise, change of air, and an agreeable occupation of the mind, which the amusements of watering places usually afford, I have no doubt, from the sensible effects produced upon the system by the waters themselves, that they also are productive of great good in a variety of diseases, some of which I shall now briefly enumerate.

"1st. From the effects of the Ballston waters, as a strong *chalybeate*, they may be employed with advantage in most diseases of debility, whether directly or indirectly such. But in those complaints which are attended with an increased excitement of the whole system, or with local inflammation they are manifestly prejudicial. These principles are deducible from the qualities of the waters alone; but they are also confirmed by the experience and observation of physicians who have attended to their operation.

"Accordingly in *intermittent* fever, *dropsy*, *dyspepsia*, *hypochondriasis*, and *hysteria*, connected with, or proceeding from debility of the digestive organs; in *paralysis*, *chronic rheumatism*, *gout* in its chronic state, *chlorosis*, *fluor albus*; in *suppression* of the *menses* when arising from weakness, in worms, and in other diseases of debility, whether of the intestinal canal, or of the whole system, the Ballston waters have been long and justly celebrated. On the other hand, in a plethoric state of the system as in *pregnancy*, in *consumption of the lungs*, *inflammation of the liver*, *acute rheumatism*, *dysentery*, and other diseases of an *inflammatory* nature, in which they are often times resorted to, they invariably do injury. We may, perhaps, except from this remark a *species of consumption* which arises in females about the time of puberty, in which, from want of energy in the system, menstruation does not take place at the period in which it usually appears; dyspepsia ensues, followed with general irritation of the nervous system, pain in the breast, cough, sometimes hæmorrhage from the lungs, and ultimately terminating in confirmed consumption. These consequences have frequently been prevented by a course of iron, and vegetable tonics, aided by generous diet, and exercise, especially riding on horseback. Under similar circumstances I have no doubt that the Ballston waters may be

serviceable in this species of phthisis in its incipient state; but they should never be employed in diseases of this nature, without the advice of a physician.

"2d. From the *saline impregnation* of these waters, and their operation upon the urinary organs as well as by perspiration, they are indicated in diseases of the *kidneys* and *bladder*, in *gout*, *chronic rheumatism*, and *eruptions* upon the skin, all which diseases are most frequently produced by, or connected with a morbid condition of the fluids, and an impaired state of the secretions. In these complaints, I have repeatedly prescribed these waters with the best effects.

"But according to the foregoing analysis, they contain an ingredient of great value besides those already enumerated; I mean the *muriate of lime*. It appears upon the authority of Dr. Beddoes, Dr. R. Pearson, Dr. Wood, and Dr. Schraud of Vienna, that this substance has lately been discovered to be a remedy for *scrofula*, which hitherto has been the opprobrium of our profession. It is true, cases have been recorded by Russell and others of the cure of this disorder by the use of sea water. But as it has been ascertained by chemists, that the muriate of lime enters into the composition of sea water, it is very possible that much of the efficacy of the latter, in that disease, may be derived from the muriate of lime which it has been found to contain.

"But as scrofula is usually attended with a general debility of the system, as well as a morbid condition of the fluids, the Ballston waters will probably be found peculiarly serviceable, inasmuch as they possess the means of invigorating the system, at the same time that they contain the antidote to the peculiar virus of that disease.

"But to obtain the benefits of the Ballston waters in any of the diseases which have been noticed, it is necessary that in the use of them, as it regards the time of taking them, the quantity taken, the stage of the disease, and other circumstances which must govern their exhibition, the directions of the physician are indispensably necessary. As well might the patient make use of any other article of the Materia Medica without medical advice, as drink these waters in the manner in which they are usually taken. It is but a short time since, a very valuable life was destroyed by the imprudent use of them during a state of pregnancy. A few days ago I was consulted by two gentlemen who had left the springs

much worse than they had gone to them. The one labored under dyspepsia, attended with habitual costiveness. Neglecting to relieve his bowels, he commenced the use of the waters; the consequences were, an aggravation of his disease, followed with fever, acute pain in the head, and other symptoms of general excitement. The other person refered to, had come from Virginia, on account of an obstinate chronic diarrhœa, attended with great debility, and general emaciation. Without advice he immediately began to drink the waters to the quantity of several quarts daily. The consequences may readily be imagined; an increase of his disease, and a degree of debility from which he with difficulty recovered."

OF THE WATERS OF STAFFORD SPRING IN THE STATE OF CONNECTICUT.

The waters of Stafford spring have been subjected to a partial analysis by the late Dr. Samuel Willard.

Though far from being complete, for the want of proper agents or tests, the results of his experiments favor the conclusion, 1st. That "iron is the prevailing ingredient in the water,—that it is held in solution by the carbonic acid,—that when the water is exposed to the action of the atmospheric air, or is acted on by heat, the acid is extricated, and the iron precipitated,—the purple colour struck by the vegetable astringents, and by distilled spirits—the precipitate produced by the caustic fixed alkali, and the blue tinge communicated to the water, by calcareous and alkaline prussiates all indicate the presence of iron.

2d. That the water is also impregnated with the sulphuretted hydrogenous gas, its sulphureous smell, its possessing the property of blackening silver, and its receiving a green tinge from the admixture of vegetable purple juices, may be considered as proofs.

3d. That the water contains aluminous and magnesian earth, its effects on soap, its effervescing with the sulphuric acid, when deposited as a sediment, and the new combination which takes place on the admixture of that acid, induce a belief of this fact."

A SHORT ACCOUNT OF THE ARTIFICIAL MINERAL WATERS IN THE UNITED STATES.

Taken from Conversations on Chemistry.

The extensive utility of many of the natural mineral waters has been long established by the experience of mankind, and sanctioned by the opinions of the first medical practitioners of every enlightened country.

The accurate analysis of all the most important and celebrated mineral waters has been accomplished by men competent to the task; and we are thus informed not only concerning the *nature*, but the *proportion* of the ingredients which they contain. They are either *solid substances* such as water can dissolve, or *gases*, capable of being combined with this fluid. To both of these the mineral waters owe their medicinal powers, and to the latter alone, and *chiefly to the carbonic acid*, their peculiar activity, briskness, and pungency.

In the manufacture of artificial mineral waters, the original water is perfectly imitated, by the addition of all the ingredients in the proper proportions; and the gas, by a peculiar and very powerful apparatus is afterwards forced in, till the waters acquire a degree of briskness and activity far surpassing any thing which they ever exhibit in nature.

The impression, entertained by some, that a perfect imitation of the native mineral waters is impossible, is therefore equally contrary to the decisions of good sense, as it is repugnant to experience; for in London, in Paris, and in many other great towns, artificial mineral waters are thus fabricated; and used to great extent.

In the artificial waters, we always have it in our power to leave out noxious, or useless ingredients; to substitute others, and to vary the proportions at pleasure. Every species of mineral waters whatever can be prepared by art; but the principal ones that have been attempted in this country, are the Ballston, Soda, and the Seltzer waters.

BALLSTON WATER.

The Ballston water is well known in the United States as a gentle cathartic; an active diuretic; a remedy against gravelly complaints; a tonic to the stomach, and generally to the system; not to mention its efficacy against

rheumatic and cutaneous complaints, when applid externally, as well as internally. It remains to be, added only, that the artificial Ballston water is found by experience to produce the effects of the natural water; it is, however, more powerful, and therefore an equal quantity produces more marked effects.

SODA WATER.

The Soda is not an exact imitation of any natural water, but has been directed by medical men as a remedy in a number of common and troublesome complaints. It is ordered in the Pharmacopœias and Dispensatories, and their prescriptions should be followed in this manufacture. It is a complete remedy against sourness of the stomach, commonly called heartburn, and in most cases of indigestion and weakness of the stomach it is very useful; gradually restoring the appetite, and with it the tone of the organ. It is a preventative of many of the diseases of the stomach and bowels, which proceed from acidity, and for the same reason it often removes or prevents the sick headach. As a palliative, and even a remedy, in some cases of urinary calculi and gravelly complaints, it is preferable to the Ballston water. It may prevent, arrest, retard, or remove the complaint, according to circumstances.

The Soda water is also a very refreshing, and to most persons a very grateful drink, especially after heat and fatigue, and may be made a complete substitute for the beverages of which ardent spirits form a part. With wine and sugar it is very grateful.

SELTZER WATER.

The Seltzer water has long been known, and is one of the most famous of the natural mineral waters of Europe. On account of its agreeable taste and exhilarating effects, it is largely used at table, and as a beverage at all hours. It is a diuretic, and possesses considerable efficacy in nephritic and urinary complaints. It is very useful against bilious and dyspeptic affections, and in many cases of cutaneous eruptions. It possesses a peculiar power of allaying feverish irritation, and has done much service in slow hectic fevers. It mixes well with milk, and is thus used with advantage by hectic patients. It is used also with sugar and wine.

The manufacture of mineral waters upon correct chemical principles, was undertaken in New Haven, Con-

necticut, about three years ago; and during the last summer, a public establishment for this purpose was opened in the same town, under the direction of Professor Silliman. An establishment of the same kind, and under the same direction, was effected in New York in April of this year (1809) by Noyes, Darling, and Co. Fountains of Ballston, Soda, and Seltzer waters were opened in the bar of the Tontine Coffee House. The cisterns are placed in the cellar, and the waters are conveyed into the bar in block-tin tubes, which pass up into mahogany pillars, crowned with gilt urns, lettered with the names of the respective waters. The pillars, with their urns, stand a foot apart, and the middle one is raised above the others; silver stop-cocks inserted into the sides of the pillars, give the whole much neatness and richness of appearance.

The proprietors of this establishment intend, as we understand, to open fountains at the City Hotel, in the month of May, in a spacious room, fitted up and ornamented in a handsome style, and adapted to the accommodation of ladies as well as gentlemen.

The Ballston and Seltzer waters are prepared according to an accurate analysis; and in order to give the Soda water its proper efficacy, it is made with the full proportion of soda directed by the Dispensatories. The waters are bottled for exportation, in any quantity demanded.

Soda water has been made in New York by Mr. Usher, for a year or more, and has had a good reputation and an extensive sale. It has been sold from a fountain, and in stone bottles. We understand that he is about to extend his establishment. There have been, for some time, manufactories of mineral waters in the city of Philadelphia, and we are informed that these waters have been extensively used.

To the preceding statement it remains to be added, that a public establishment of a similar nature has been introduced into the town of Boston by Mr. John P. Whitwill. The Soda and other waters which he manufactures have acquired considerable reputation, and proved extremely salutary and useful. From the great attention and exertions of the proprietor, very satisfactory and beneficial effects have been derived, and the utility of his undertaking is becoming more and more extensive and important.

No. II.

MEDICAL PRESCRIPTIONS.

The principal objects designed to be attained by the composition of medicines, are, to communicate an agreeable taste or flavour; to give a convenient form; to correct the operation of the principal medicine, or obviate some unpleasant symptom it is liable to produce; to promote its action, by the additional article exerting one of a similar kind; to obtain the joint operation of two remedies, having different powers; or to alter their usual effects, by the power which one may have of modifying the action of another.

A prescription has been usually divided into four parts, which compose it,—the *basis*, or principal article; the *adjuvans*, or that designed to promote the action of the former; the *corrigens*, or that which is intended to correct its operation, or obviate any unpleasant symptom which it may be apt to produce; and the *constituens*, or that which gives to the other ingredients consistence or form. These are not necessarily present in every formula; nor is the division of much importance, exeept as perhaps affording the best principle for regulating the order in which the ingredients of a prescription should be enumerated.

The following are the principal circumstances to be attended to in forming a prescription.

1st, Simplicity should be attained, as far as is consistent with the objects of the prescription. Nothing ought to enter into the composition which does not add to its virtue, render it less ungrateful, give it a convenient form, or which is not necessary to conceal any particular ingredient; and, in general, the practice of accumulating a number of articles in one prescription is to be avoided.

2dly, Substances, it is evident, ought not to be mixed together, which are capable of entering into chemical combination, or of decomposing each other, unless it be with the view of obtaining the product of the combination, or decomposition, as a remedy.

3dly. Those mixtures are also to be avoided, in which one medicine, by its peculiar action on the stomach or general system, modifies and changes the action usually exerted by another, unless where the object is to obtain the effects of that modified operation.

4thly, The error of contra-indication is to be guarded against, or those medicines ought not to be combined, the virtues of which are not merely different, but are, in some measure, opposed to each other.

5thly, The ingredients which are to be mixed, must be such as will mix properly together, so that the form in which the remedy is designed to be exhibited, may be easily obtained and preserved.

Lastly, The form under which a medicine is prescribed, must be adapted to certain circumstances; principally to the nature of the disease, the nature of the remedy itself, and, as far as may be possible, to the taste of the patient.

The doses of medicines are not reducible to any general rules, from their general similarity of operation, or any other circumstance. The principal circumstances by which they are influenced are, Age, Sex, Temperament, Idiosyncrasy, Habit, and Disease.

Age.....From infancy to manhood, a larger dose of any medicine is requisite to produce its effect, in proportion to the advance in life. From manhood to old age, there is a similar gradation with regard to diminution of dose, though in a much less proportion than that which regulates the increase. The following table has been supposed to shew these proportions.

TABLE.

Let the dose for a person of middle age be	1 or 1 drachm.
For one from xiv to xxi years, it will be	$\frac{2}{3}$ or 2 scruples.
..... vii to xiv, ...	$\frac{1}{2}$ or half a dr.
..... iv to vii, ...	$\frac{1}{3}$ or 1 scruple.
..... of iv years of age, ...	$\frac{1}{4}$ or 15 grains.
..... iii	$\frac{1}{6}$ or half a scr.
..... ii	$\frac{1}{8}$ or 8 grains.
..... i	$\frac{1}{12}$ or 5 grains.

Sex.....Women, in general, require smaller doses of any medicine than men, a difference probably owing to their greater sensibility from their habits of life.

Temperament.....Those of the sanguine temperament are supposed to be more affected by medicines, and there-

fore to require smaller doses than those of the phlegmatic or melancholic; but in what has been said on this subject, there is so much uncertainty, that little reliance can be placed on it.

Idiosyncrasy.....This denotes that disposition in individuals to be affected by certain causes, in a manner different from the generality of mankind. Such idiosyncrasies are observed with regard to medicines, as well as to other agents; and, where they are known, require to be attended to by the prescriber.

Habit.....This has an important influence on the operation of medicines. In general, they lose some of their power by having been long continued. This is particularly the case with all strong stimulants and narcotics, and is even observed, to a certain extent, in some of the other classes of the Materia Medica. In a few instances, the reverse has been supposed to hold true.

Disease.....This has an influence on the doses of medicines not less important; the susceptibility to external impressions, and to action, being much varied in morbid affections, and the operations of remedies of course being modified by such variations. The state of susceptibility being in general apparent, when it varies much from the healthy standard, the doses of the medicines administered are easily regulated. *Murray.*

No. III.

ON THE NATURE AND MEDICINAL USES OF THE GASES.

BY A FELLOW OF THE MASSACHUSETTS MEDICAL SOCIETY.

The term gas, introduced into the nomenclature of chemistry, by Van Helmont, is synonymous with air, and applied to a class of bodies, invisible, highly attenuated, compressible, and permanently elastic at the common temperature of the atmosphere, and the lightest of substances, whose specific weight is susceptible of demonstration.

Every species of gas owes its form to the caloric with which it is combined. By the introduction of this agent, the particles which constitute the basis of the air, are made to recede to a greater distance from each other, cohesive attraction is destroyed, and a repulsive power is acquired, in consequence of which, they would fly off to an indefinite distance, were it not counteracted by a proportional external pressure. By the abstraction of caloric to a certain degree, the distance between the particles of the air or gas is diminished, they are still capable of moving freely over the surfaces of each other, although cohesive attraction be so far augmented as to constitute them liquids. Hence, as the airs obviously owe their specific forms merely to the quantity of caloric with which they are united, it has been infered by chemists, that they are formed by the solution of certain unknown bases in heat. For example, the term *oxygen* is applied to a substance of peculiar properties, which, by its union with caloric, is rendered capable of assuming the form of an invisible, inodorous, insipid, permanently elastic, and compressible fluid, denominated *oxygen gas*. When this air or gas exerts an attraction for other substances, and enters into

combination with their particles, the oxygen, or the base alone, is the subject of the change, and the other principle, the caloric, is evolved or becomes sensible. Hence the origin of the heat during the transition of oxygen from the aeriform to the solid state. The same observations are equally applicable to the other species of gases. By the diminution of the capacity of an air for caloric, even without altering its form, by simple compression, a quantity of heat may be evolved, sufficient to produce, by a peculiar arrangement, the ordinary effects of combustion. Of the precise nature of the bases of the different gases, we are still ignorant, for no attempts to obtain them independent of their combinations, have yet proved successful.

The difference between gas and vapour is the property, possessed by the former, of remaining permanently elastic (with the single exception of the oxygenized muriatic acid gas*) at the common temperatures of the atmosphere, while the latter, though it retain its elasticity for a time, is ultimately condensed, and restored to the state of a liquid.

The gases are susceptible of their peculiar form at very low temperatures, for the abstraction of caloric to the greatest extent observed in nature, or produced by art, has never been sufficient to deprive them of their elasticity, and reduce them to the state of liquids, or of solids: on the contrary, in the formation of vapour, the temperature of the liquid is augmented above that of the surrounding air, it rises in the atmosphere, where its caloric, from its repellent power or tendency to equilibrium when accumulated in a body, is gradually abstracted, its particles again approximate toward each other, and it reassumes the form of liquid. Hence, says Mr. Murray,

* Gaseous ammonia is another exception to the general observation, that the airs are incapable of undergoing a change of form by a reduction of temperature. This abstraction of heat, however, must be great, and is to be effected by art. According to the experiments of Guyton, ammonia retains its elastic form at any temperature above 56°, but below that point it is converted into a liquid, an effect ascribed by Mr. Murray, to the presence of water, with a portion of which, that gas is always found strongly combined. It reassumes the aerial form as the temperature rises.

"the distinction between gas and vapour is merely relative, and arises from the difference of temperature, at which they were formed."*

In the enumeration of the different species of the extensive genus of gases, we shall confine ourselves to the description of the properties of those, which, in consequence of their peculiar action on the nervous system, and their well known influence in exciting or depressing the vital powers, have been lately introduced as a distinct class of remedies, into the Materia Medica. The observations of Lavoisier, confirmed by the more extensive and hazardous experiments of Mr. Davy, have sufficiently demonstrated, which indeed was thought probable a priori, that the different species of airs, when taken into the lungs, produce very powerful effects on animal life. The respiration of some of them is accompanied with all the effects of increased excitement. The pulsations of the heart and arteries are accelerated, respiration is hurried, the brain labours with intense thought, new ideas and images present themselves to the imagination, and produce new combinations and associations, a propensity to muscular motion, almost irresistible, is excited, and the whole frame glows with a sense of "pleasurable existence."† The breathing of others, on the contrary, is followed by vertigo and sickness, the senses grow less acute, a painful sensation of stricture across the chest is produced, respiration becomes irregular and laborious, and the pulsations of the heart almost imperceptible, the wish and even the power of muscular motion is for a time extinguished, and the vital powers of the system slowly recover from the almost annihilating influence of these invisible agents. Hence it is obvious, that the airs are capable of acting as remedies in two ways, either by exalting or by depressing the vital powers of the constitution. Of the first class there exist but two species, oxygen gas and nitrous oxide gas.

1. Oxygen Gas.

This gas, generally obtained from the black oxide of manganese by the application of heat, is an invisible, inodorous, insipid, permanently elastic fluid, rather heavier than atmospheric air, and characterized by the property

* Murray's Chemistry, vol. ii. p. 10.

† Davy's Researches.

of eminently supporting the processes of respiration and combustion. As the capacity of atmospheric air to continue these actions has been sufficiently demonstrated to depend on the oxygen it contains, it was reasonable to suppose, that, when respired pure and undiluted, it would have no inconsiderable influence in increasing the activity of the vital powers. The experiments, however, of Mr. Davy prove that this stimulant effect is not so positive as might be infered, for on breathing from and into a bag containing twenty quarts of oxygen gas, nearly six minutes, the only deviation from his usual standard of health, perceptible, was an increased hardness of the pulse, and an oppression at the chest analogous to that arising from the want of fresh air.* It is probable that during the respiration of this air the system is excited, partly by a stimulating quality imparted to the blood, and partly by the more direct application of the stimulant to the nervous expansions on the membranes of the lungs. The diseases, in which oxygen gas has been administered medicinally, are those of a chronic nature, where the various functions of the system are languid and debilitated. In these it has been respired always more or less diluted with atmospheric air, in the quantity of from one to two quarts daily, according to the effects produced by its inhalation.†

2. Nitrous Oxide Gas.

This interesting compound, the effects of which on the human system were first discovered by Mr. Davy, is formed by the union of thirty-seven parts of oxygen and sixty-three of nitrogen. It is a product of art, and is obtained in the greatest purity by the decomposition of the nitrate of ammonia by heat. The degree of temperature must be regulated by the texture of the salt. In order to obtain it with ease from the compact nitrate, the temperature should be preserved between the 310° and 480° Fahrenheit; the decomposition of the fibrous nitrate is effected between 400° and 450°. The products of this distillation are water and nitrous oxide gas. The theory of the formation of these substances is obvious. The hydrogen of the ammonia combines with a portion of the oxygen of the nitric acid, and forms water, while the remaining oxygen unites with the residual nitrogen

* Researches, p. 474.

† Murray, Mat. Med. vol. ii. p. 286—7.

both of the ammonia and acid, and produces the nitrous oxide, which passes over into the receiver in the form of gas, carrying with it a portion of the salt which may have escaped decomposition, from which it may be freed by standing a short time in contact with water.

The effects on the system, resulting from the respiration of this gas, are very remarkable, and are amply detailed in the "Researches" of Mr. Davy. It operates like a very powerful and general stimulus on the vital powers. Objects appear to the subject under its influence magnified and of a dazzling lustre. The sense of hearing is often painfully acute; the whole frame glows with a consciousness of pleasurable sensation. If the inhalation be continued the patient nearly loses all connection with the objects which surround him; he gradually passes into a state of delirium, when the various faculties of the mind act with unknown and uncontrollable energy; respiration is hurried, the pulse is accelerated, and an irresistible propensity to muscular motion is evinced, which exhausts itself in laughing, stamping, exclamations of joy, and walking. These effects continue for a few minutes, and at length gradually subside, though the impression on the system often gives a charm to existence for many hours. Unlike the operation of other stimuli, the respiration of the nitrous oxide gas is unattended by any exhaustion or debility of the vital powers, and although the stimulation have perhaps amounted to a degree, beyond which the functions of the body might remain permanently impaired, it passes off almost insensibly, and leaves no unpleasant traces of its powers. "A substance capable of acting in such a manner, we might suppose, would prove one of our most valuable remedies. The transient nature of its operation must undoubtedly limit its medicinal efficacy, but still in diseases of extreme debility we seem justified in expecting from its exhibition the most beneficial effects. The dose which is necessary to produce its peculiar effects varies from four to nine quarts, which may be breathed pure or diluted with atmospheric air. It cannot be breathed for more than four minutes and a half, insensibility being induced."*

The gases inimical to animal existence constitute a much more extensive class than the preceding, and appear to be destructive of life, either by simply excluding oxy-

* Murray's Mat. Med. vol. ii. p. 288—9.

gen from the lungs, or by some positive action on the nervous system. All the airs, with the exception of oxygen and nitrous oxide, may be supposed to produce their effects in one of these modes. The administration, however, of these has been confined to hydrogen, nitrogen, carbonic acid, and carburetted hydrogen gases; the two first of which are negative, and the two last positive, with regard to their action on the human system.

1. Hydrogen gas.

For the purposes of respiration this gas should always be procured by the decomposition of water transmitted in vapour over the surface of ignited iron. "In a pure state, if the lungs have been previously emptied as much as possible of atmospheric air, it cannot be breathed above three quarters of a minute. It quickly occasions a giddiness and sense of suffocation; the countenance becomes livid, and the pulse sinks rapidly; but, when diluted with two thirds or an equal bulk of atmospheric air, it can be safely breathed; nor does it appear to produce any very important effect. It occasions some diminution of muscular power and sensibility, and of the force of circulation. It has been used in catarrh, hæmoptysis, and phthisis, but its powers seem merely those of a palliative."* Hence it may be inferred that hydrogen, like nitrogen gas, operates only by the exclusion of oxygen, and not by any positive influence on the nervous system.

3. Carbonic acid gas.

This aerial fluid has acquired some celebrity in medicine, and has often been administered by respiration; by the introduction of substances into the stomach from which it is easily disengaged; and as an antiseptic in cases of topical gangrene. It may be obtained with facility, and in a state of purity by the exposure of carbonate of lime to a strong red heat in an iron tube, and collecting the gas over water. By the experiments of Mr. Davy, it appears to produce an acid taste in the mouth and fauces, and a sense of burning at the top of the uvula. When arrived to the upper part of the trachea, it is instantly stimulated to such a degree as to excite a spasmodic constriction of the glottis, and render it incapable of transmitting a particle of the air into the lungs. The same effects are produced even when diluted with an equal bulk of atmospheric air. But when the

* Murray's Mat. Med.

proportion of the two gases is about three quarts of carbonic acid to nine of atmospheric air, the mixture may be breathed for a short time with impunity. The symptoms resulting from its respiration in this way, are those of a weak sedative, producing a slight degree of giddiness, and an inclination to sleep. The effects, however, are temporary, and rapidly disappear after ceasing to breath the air.

This gas has been highly recommended in the cure of diseases of increased excitement, particularly phthisis pulmonalis; and patients have even been persuaded to visit daily, and even to reside in those places, particularly brewhouses, in which there is a constant copious production of this depressing power. There are few cases on record, in which it has done more than act like an anodyne to diminish sensibility, and thus smooth the path to the grave.

This substance has perhaps proved more permanently useful as a local application to phagedenic ulcers and incipient gangrene, conveyed to the part through the fermenting poultice, from which it is extricated, or by means of a flexible tube, in its pure uncombined state.

4. Carburetted Hydrogen Gas.

This is undoubtedly the most deleterious of all the gases which have been employed to diminish the morbid actions of the animal system. It is usually prepared by passing the vapour of water over the surface of charcoal, heated to ignition in an iron tube. The fluid is decomposed; its oxygen enters into combination with a portion of the carbon, and produces carbonic acid, while the hydrogen thus liberated unites with the remaining carbon, forms carburetted hydrogen gas, which, mixed with the other aerial product, passes over into the receiver, and is freed from the latter by agitation over lime water. Respired in a diluted state, it produces very alarming effects on the vital powers, and when pure almost immediate death. The rashness of Mr. Davy, in attempting its respiration, had nearly cost him his life. When diluted with atmospheric air, in the proportion of three quarts of the former to two of the latter, its inhalation was followed by a slight giddiness, pain in the head, and momentary loss of muscular power, attended by a quick and feeble pulse. When pure, however, the effects were much more positive and alarming. "After a forced exhaustion of my lungs," says Mr. Davy, "I made three

inspirations and expirations of the hydro-carbonate. The first inspiration produced a sort of numbness and loss of feeling in the chest, and about the pectoral muscles. After the second inspiration, I lost all power of perceiving external things, and had no distinct sensation, except a terrible oppression on the chest. During the third expiration this feeling disappeared. I seemed sinking into annihilation, and had just power to drop the mouth piece from my unclosed lips."—"Putting my finger on my wrist, I found my pulse thread-like, and beating with excessive quickness." The system was a long time in recovering from the effects of this experiment. From the action of this gas on his nervous system, it was inferred by Mr. Davy, that its operation is directly sedative, or productive of a diminution of vital powers and debility, without previous excitement.

The medicinal effects of this air are most obvious in phthisis pulmonalis, and it is to this disease, that its administration has in general been directed. According to the experiments of Dr. Beddoes, it has in many cases relieved the symptoms and suspended the disease. Its respiration, however, must be regulated with caution. The gas should at first be highly diluted, and its strength gradually increased, in proportion as the system becomes accustomed to its action. The quantity to be respired should vary from one to four quarts a day.

[The practice of pneumatic medicine was at no very distant period advocated by European physicians of the most respectable rank. Drs. Priestley, Percival, Withering, and Beddoes were those, who reported in favour of the efficacy of both the *carbonic acid gas*, and *carburetted hydrogen gas*, in that fatal disease phthisis pulmonalis. In some instances, permanent cures were effected by their use, and in numerous others the hectic fever was greatly diminished, and the matter expectorated rendered less offensive and better digested. By some the aerial fluid, when administered, was mixed with atmospheric air, by others, the patients were directed to inspire the gas from an effervescing mixture of chalk and vinegar, or vinegar and potass, from which much relief was constantly experienced. The same mode of treatment has been adopted by Dr. Jonathan Leonard, of Sandwich, in this state, a man of experience and correct observation, who affirms that, in five patients with ulcerated lungs, he persevered

in the use of the carbonic acid gas until perfect cures were effected, and in no instance of trial has it ever failed in his hands. The patients exhibited unequivocal marks of phthisis pulmonalis, some had hectic fever, and all were afflicted with that description of symptoms, which in common practice we are accustomed to consider as desperate. He asserts that the carbonic acid gas reduces the frequency of the pulse with as much certainty as the digitalis, and that it speedily produces a copious expectoration, not unfrequently a nausea and some vomiting, and ultimately the appetite is in some measure impaired. In one case, there was no expectoration of pus after commencing the process of inhaling the gas, though previous to it the purulent discharge was great, and the patient was evidently hectical. During the course he prescribed only some demulcent expectorants, to which no part of the cure is to be ascribed. The gas is administered by a very simple process; a quantity of carbonate of lime (chalk or marble) coarsely powdered, is put into a common bottle. Sulphuric acid diluted to the strength of about five or six parts of water to one of the acid being poured upon the carbonate, the gas is instantly extricated, and the patient inhales it through a small tube or quill passing through the cork. A sensation of pain and heat, about the uvula and glottis, is induced by the gas, but it is in general found practicable to continue the inspiration about fifteen or twenty minutes each time, and the operation is repeated three or four times in twenty-four hours. The practice is often persevered in for several weeks, and some patients have expended one or two pounds of the sulphuric acid.]

No. IV.

MEDICAL ELECTRICITY.

The application of this subtle fluid to medicinal purposes, was thought of, soon after the discovery of the electric shock. At the first introduction of electricity as a remedy, it was very highly celebrated for its efficacy in a number of diseases; and after various turns of reputation, its medical virtues seem now to be pretty well established.

The medicinal operation of electricity may be refered to its stimulant power. It produces forcible contractions in the irritable fibre; excites therefore to action if duly applied; and when in excess, immediately exhausts irritability. It possesses the important advantage of being easily brought to act locally, and of being confined to the part to which it is applied, while it can also be employed in every degree of force.

Electricity is applied to the body under the form of a stream or continued discharge of the fluid, under that of sparks, and under that of shock; the first being more gentle, the second more active, and the last much more powerful than either of the others. The stream is applied by connecting a pointed piece of wood, or a metal wire, with the prime conductor of the electrical machine, and holding it by a glass handle, one or two inches from the part, to which it is to be directed. A very moderate stimulant operation is thus excited, which is better adapted to some particular cases, than the more powerful spark or shock. The spark is drawn by placing the patient on the insulated stool, connected with the prime conductor, and, while the machine is worked, bringing a metal knob within a short distance of the part, from which the spark is to be taken. A sensation somewhat pungent is excited, and slight muscular contractions may be produced; these effects being greater or less, accord-

ing to the distance at which the knob is held, if the machine be sufficiently powerful. The shock is given by discharging the Leyden phial, making the part of the body, through which it is intended to be transmitted, part of the circuit. The sensation it excites is unpleasant, and the muscular contractions considerable, if the shock be moderately strong.

The general rule for the medical employment of electricity, is to apply it at first under the milder forms, and gradually to raise it, if necessary, to the more powerful. Mr. Cavallo, who has published the latest and best treatise on medical electricity, entirely disapproves of giving violent shocks, and finds it most efficacious to expose the patient to the electrical aura discharged from an iron or a wooden point; or, if shocks be given, they should be very slight, and not exceed thirteen or fourteen at a time. In this way he recommends it as effectual in a great number of disorders. The patient may be electrified from three to ten minutes; but, if sparks be drawn, they should not exceed the number of shocks above mentioned.

Rheumatic disorders, even of long standing, are relieved, and generally quite cured, by only drawing the electric fluid by a wooden point from the part, or by drawing sparks through flannel. The operation should be continued for about four or five minutes, repeating it once or twice, every day.

Deafness, except when it is occasioned by obliteration, or other improper configuration of the parts, is either entirely or partly cured by drawing the sparks from the ear with the glass tube director, or by drawing the fluid with a wooden point.

Toothach, occasioned by cold, rheumatism, or inflammation, is generally relieved by drawing the electric fluid with a point, immediately from the part, and also externally from the face. But when the body of the tooth is affected, electrization is of no use, for it seldom or never relieves the disorder, and sometimes increases the pain to a prodigious degree.

Swellings, in general, which do not contain *matter*, are frequently cured by drawing the electric fluid with a wooden point. The operation should be continued for three or four minutes every day, and in obstinate cases it is sometimes necessary to persevere in its use for several weeks.

In inflammations of the eyes, the throwing of the electric fluid, by means of a wooden point, is often attended

with great benefit; the pain being quickly abated, and the inflammation being generally dissipated in a few days. In these cases, the eye of the patient must be kept open; and care should be taken not to bring the wooden point very near it, for fear of any spark. Sometimes it is sufficient to throw the fluid with a metal point; for in these cases, too great an irritation should always be avoided. It is not necessary to continue this operation for three or four minutes without intermission, but after throwing the fluid for about half a minute, a short time may be allowed to the patient to rest and wipe his tears, which generally flow very copiously; then the operation may be continued again for another half minute, and so on for four or five times every day.

Palsies are seldom perfectly cured by means of electricity, especially when they are of long standing; but they are generally relieved to a certain degree; the method of electrifying in those cases, is to draw the fluid with the wooden point, and to draw sparks through flannel, or through the usual covering of the parts, if they are not too thick. The operation may be continued for about five minutes per day.

Ulcers, or open sores of every kind, even of long standing, are generally disposed to heal by electrization. The general effects are a diminution of the inflammation, and first a promotion of the discharge of properly formed matter; which discharge gradually lessens, according as the limits of the sore contract, till it be quite cured. In these cases, the gentlest electrization must be used, in order to avoid too great an irritation, which is generally hurtful. To draw or throw the fluid with a wooden, or even with a metal point, for three or four minutes per day, is fully sufficient.

Cutaneous eruptions have been successfully treated with electrization; but in these cases it must be observed, that if the wooden point be kept too near the skin, so as to cause any considerable irritation, the eruption will be caused to spread more; but if the point be kept at about six inches distance, or farther if the electrical machine be very powerful, the eruptions will be gradually diminished till they are quite cured. In this kind of disease, the immediate and general effect of the wooden point, is to occasion a warmth about the electrified part, which is always a sign that the electrization is rightly administered.

Scrofulous tumors, when they are just beginning, are generally cured by drawing the electric fluid with a wooden or metal point from the part. This is one of those kinds of diseases in which the action of electricity requires particularly the aid of other medicines in order to effect a cure more easily; for scrofulous affections commonly accompany a great laxity of the habit, and a general cachexy, which must be obviated by proper remedies.

Locked-jaw has in some instances been speedily cured by small shocks passing through the jaws.

Nervous headachs, even of long standing, are generally cured by electrization. For in this disease, the electric fluid must be thrown with a wooden, and even sometimes with a metal point, all round the head successively. Sometimes exceedingly small shocks have been administered; but these can seldom be used, because the nerves of persons subject to this disease are so very irritable, that the shocks, the sparks, and sometimes even the throwing the electric fluid with a wooden point kept very near the head, throw them into convulsions.

Amenorrhœa, a disease of the female sex, that often occasions the most disagreeable and alarming symptoms, is often successfully and speedily cured by means of electricity, even when the disease is of long standing, and after the most powerful medicines, used for it, have proved ineffectual. The cases of this sort, in which electrization has proved useless, are so few, and the successful ones so numerous, that the application of electricity for this disease, may be justly considered as an efficacious and certain remedy.

Small shocks, that is, of about one twentieth of an inch, may be sent through the pelvis; sparks may be taken through the clothes from the parts adjacent to the seat of the disease; and also the electric fluid may be transmitted, by applying the metallic or wooden extremities of two directors to the hip in contact with the clothes; part of which may be removed, in case they be too thick. Those various applications of electricity should be regulated according to the constitution of the patient. The number of shocks may be about twelve or fourteen. The other applications may be continued for two or three minutes; repeating the operation every day. But either strong shocks, or a stronger application of electricity than the patient can conveniently bear, should

be carefully avoided; for by those means, sometimes disagreeable symptoms are produced.

The application of electricity has also been beneficial in other diseases besides the abovementioned; but as the facts are not sufficiently numerous to afford the deduction of any general rules, we have thought not proper to take any particular notice of them. We may lastly observe, that, in many cases, the help of other remedies to be prescribed by the medical practitioner, will be required to assist the action of electricity, which by itself would, perhaps, be useless; and, on the other hand, electrization may often be applied to assist the action of other remedies, as of sudorifics, strengthening medicines, &c. It not unfrequently happens that electricity is relinquished as an unsuccessful remedy, when by a more rigid perseverance a cure might have been effected.

N. B. The substance of the above article may be found in the Encyclopedia, American edition.

No. V.

GALVANISM.

The peculiar power, which is generated, when two metals moistened are in contact, at first named animal electricity, since Galvanism, discovered by Professor Galvani, at Bologna, has been recently applied as a remedy in various morbid affections. Its effects on the animal system are such as warrant this application. Its activity is shewn, by its exciting strong sensations, in sensible parts, and powerful contractions in parts endowed with irritability. These singular phenomena take place in consequence of a mutual communication between any two points of contact, whether more or less distant, in a system of muscular and nervous organs. The extent of this communication may be considered as a complete circle divided into two parts, one of which, comprising the organs of the animal under the experiment, is called the *animal arc;* the other, which is formed by the metals or galvanic exciters, is denominated the *excitatory arc;* and consists of more than one piece of various kinds.

Beside the effect thus produced on the muscles, the impressions made on the organs of sense are equally remarkable. For instance, if a thin plate of zinc be placed on the upper surface of the tongue, and half a crown, shilling, or teaspoon, be laid on the lower surface of the tongue, and both metals after a short space of time be brought into contact, a peculiar sensation, similar to taste, will be perceived, at the moment when the mutual touch happens. A similar perception will result both at the moment of contact, and that of separation, if one of the metals be applied as high as possible between the gums and upper lip, or even under the tongue.

Signior *Volta's* apparatus consists of a number of copper or silver plates, (which last are preferable,) together with an equal number of plates composed of tin, or still better of zinc, and a similar number of pieces of card, leather, or woollen cloth, the last of which substances appears to be the most suitable. These last should be well soaked in water saturated with common salt, muriate of ammonia, or, more effectually, with nitre. The

silver or copper may be pieces of money, and the plates of zinc may be cast of the same size. A pile is then to be formed, by placing a plate of silver on a corresponding one of zinc, and on them a piece of wet cloth or card; which is to be repeated alternately, till the number required be arranged in regular succession. But, as the pieces are apt to tumble down, if their numbers be considerable, unless properly secured, it will be advisable to support them by means of three rods of glass, or baked wood, fixed into a flat wooden pedestal, and touching the pieces of metal at three equi-distant points. Upon these rods may be made to slide a small circular piece of wood, perforated with three holes, which will serve to keep the top of the pile firm, and the different layers in close contact. The moistened pieces should likewise be somewhat smaller than those of metal, and gently squeezed before they are applied, to prevent the superfluous moisture from insinuating itself between the pieces of metal.—Thus constructed, the apparatus will afford a perpetual current of animal electric fluid, or galvanic influence, through any conductor that communicates between the uppermost and lowest plate; and, if one hand be applied to the latter, and the other to the highest metal, a shock will be perceived, which may be repeated as often as the contact is renewed. This shock greatly resembles that given by the torpedo, or *gymnotus electricus:* and, according to the larger size of the metallic plates, the shock will be proportionably stronger. The intensity of the charge, however, is so low, that it cannot penetrate the dry skin; it will therefore be necessary to wet both hands, and to grasp a piece of metal in each, in order to produce the desired effect: its power may be considerably increased, both by an elevation of temperature, and by augmenting the number of pieces that compose the pile. Thus twenty pieces of each will emit a shock that is very perceptible in the arms; if one hundred be employed, a very severe but tremulous sensation will extend even to the shoulders; and, if the surface of the skin be broken, the action of the galvanic influence will be uncommonly painful.

The sensation of a flash, or shock with this apparatus, does not materially differ from that produced by two simple plates; but it may be effected in various ways, especially if one or both hands be applied in a wet state to the lowest plate of the pile; or any part of the face be brought in contact with a wire communicating with the

top piece. Farther, if a wire be held between the teeth, so as to rest upon the tongue, that organ, as well as the lips, will become convulsed, the flash will appear before the eye, and a very pungent taste will be perceived in the mouth.

Between galvanism and electricity there are so many points of resemblance, that they have been considerd as ultimately the same power, or, as the same subtle matter in different states. Whether this opinion be just or not, the effects of galvanism on living matter, are different from those of electricity. The sensation, which the former excites, though somewhat analogous to that produced by the latter, is still dissimilar; the action of galvanism is more extended, both to the nervous and muscular systems, than that of electricity, which is more local in its action. The galvanic excitation produces sensations and contractions in the parts, which, from disease, are insensible to electrical impressions; and the stimulant power, which both exert, appears in galvanism, to be greater in proportion to its intensity, than in electricity; or the sensations and muscular contractions, which the galvanic discharge excites, are more than proportioned to its power of producing electrical phenomena.

The diseases, in which galvanism has hitherto been employed, are principally those of the nervous kind. In paralysis, it has been affirmed to have restored the capability of muscular contraction, and consequently the power of motion. Cases of chorea, tetanus, and some other spasmodic affections, have been related, in which perfect cures were accomplished by its application. It appears, in several instances, to have relieved deafness, especially that species of it arising from torpor of the auditory nerve; and it has been successful in discussing indolent tumors.

Galvanism is applied by connecting two metallic wires with the two extremities of a galvanic battery, and bringing them in contact with the part affected, so that it shall form part of the circuit of the galvanic discharge; the one wire is kept in contact with the part it touches; the other is alternately applied for a moment and removed. If the skin be moistened, the galvanic influence is communicated more readily and effectually; and still more so if a small piece of metallic leaf be laid on the parts to which the wires are applied. Sometimes even the cuticle has been previously removed by a blister, but the galvanic application is then attended with pain.

No. VI.

AN ABRIDGMENT OF DR. CURRIE'S MEDICAL REPORTS ON THE USE OF WATER.

Dr. Currie has published a work in medicine apparently of the utmost importance, and particularly so to the United States; for whose now reigning disease it flatters us with some appearance of relief, if not of cure. The veracity of the author in all situations, is as well established as his reputation for solid and ingenious talents.

Dr. William Wright, F. R. S. formerly of Jamaica, and well known for his writings in medicine and botany, seems to have furnished a case to our author, which, joined to his own previous opinions, led him to the train of practice and observation of which we are about to give the account.—Dr. Wright, while on a voyage from Jamaica, in 1777, being attacked with fever, on the third day of it, ordered three buckets of salt water to be thrown upon himself, which gave him instant relief; and this, being repeated on the two following days, removed every symptom of disease. Another passenger, whose attack from fever had begun on August 9, copied the example, and was restored to health. A seaman, who originally communicated the fever to Dr. Wright, refusing proper assistance, died. Encouraged by these incidents, and finding that Dr. Brandreth, of Liverpool, had employed cold water externally in cases of fever, with happy effects, Dr. Currie resolved upon a series of experiments.

In December, 1787, Dr. Currie, in seven cases of contagious fever, threw cold water from a bucket upon the body of each patient; and the whole recovered. An eighth patient died, with whom the practice was omitted. The cure was *chiefly entrusted to this remedy* in one hundred and fifty-three cases, of which the author kept a register; besides many *subsequent* cases, of which he kept no register, unless where the application failed of success.

The 30th regiment of British infantry, in particular, while quartered at Liverpool, in 1792, afforded him an opportunity of trying this application with some precision; and the result of the experiment is instructive. A guard-room, prison room, two sick-rooms, and a cellar, had, by their foulness, either caused or increased a fever, which soon affected a number in the regiment. Dr. Currie being called in, the primary causes of the disaster were removed, and the patients all cleansed. Those whose strength was not greatly reduced, had cold salt water poured upon them; and the rest were sponged over with tepid vinegar. The remainder of the regiment was drawn up in its ranks, and seventeen others who had marks of the disease were separated, and subjected to the cold affusion ;* which cut the disease short in all but two of these. Those who were yet well, were ordered to bathe in the sea; being regularly mustered for that purpose. The number infected in the whole was fifty-eight; of whom twenty-six had the disease, by these means, brought suddenly to a close; but in the remaining thirty-two it ran its course. It was fatal, however, only to two; who had been weakened by visiting the West Indies, and by being bled, and who besides had not received the cold aspersion, not having been visited by Dr. Currie till the twelfth or fourteenth day of the disease. The fever broke out about the beginning of June, but no new attack occurred after the thirteenth of that month. The water employed was taken from the river Mersey; having in it 1-32 or 1-33 part of sea salt; and being of the temperature of 58 or 60 degrees of Fahrenheit's, which is our common, thermometer.

When Dr. Currie speaks of fever simply, he means the low contagious fever; which frequently is called the nervous, and in certain cases the putrid, fever; being the common fever of England, and prevailing chiefly among the poor, who are most exposed to the causes producing it. Dr. Cullen gives it the name of *typhus*; terming it *a contagious fever; in which the heat is but little increased; the pulse small, weak, and mostly quick; the urine scarcely changed; the functions of the brain and senses much disturbed; and the strength greatly reduced.*

* By *affusion* or *aspersion*, the author means the pouring of water upon a patient, as for example, from a bucket.

[*Compiler.*]

In fevers called *continued*, there is nevertheless (see Dr. Cullen and others) at least one increase and one abatement in each day. This increase of the fever is known by thirst, restlessness, and increased flushing; and also by the heat in the internal parts of the body, raising the thermometer one or two degrees beyond the average observed during other moments of the fever. As this increase (or paroxysm) usually occurs in the afternoon or evening, Dr. Currie prefers this period (other things being equal) for the cold affusion; thinking it most *safe*, as well as most *useful*, to apply the water at the height of the fit, or immediately after it has begun to decline. But he says, that the remedy may be safely used, *when there is no sense of chilliness present, when the heat of the surface is steadily above what is natural, and when there is no general or profuse perspiration;* which he observes are particulars of the utmost importance.*

During the cold stage of the fever, the cold water nearly suspends the respiration, greatly disturbs the pulse, increases the chill, and seems to bring on the struggles of death; and really would do so, if repeated. The thermometer therefore is never to govern the practitioner, where the chilliness of the patient contradicts its indications. On the other hand, the absence of chilliness is no guide, unless the thermometer concurs to shew a heat more than natural. Lastly, profuse perspiration, in fever, must for the time, deter from the operation; and especially in proportion to its continuance. Though perspiration is in itself a cooling process, yet the load of heated bed-clothes may prevent an *internal* diminution of the heat from being immediately perceived. Under these restrictions, Dr. Currie thinks, that the cold affusion may be used at any period of fever; but preferably in the beginning.

The author seems after each affusion to have rubbed the body *hastily* with towels.

The cold affusion generally reduces the heat from two to six degrees of Fahrenheit's thermometer; and the pulse sinks by it from two to above twenty beats in the

* One important caution appears to have escaped both Dr. Currie and his able commentator. That when fevers are complicated, (as they often are in this climate) with pneumonic inflammation, or other dangerous affections of the lungs, cold ablution is inadmissible. [*Compiler.*]

minute; and in one case, somewhat dubious indeed as to its issue, it fell at least forty beats.

Where the heat is reduced and the debility great, some cordial should be given immediately after the affusion; and the author thinks that warm wine is the best. In case the affusion produces effects unusually severe, then to the *cautious* use of warm cordials in small quantities, friction, and especially of the extremities, is to be added, and a bladder of hot water applied to the pit of the stomach.

Several examples are given of the effect of the cold affusion in the first, second, third, fourth, and succeeding days of fever. On the first and second days, the disease often instantly vanishes with one aspersion; and sometimes on the third day; but on the fourth day this is rare. Each aspersion, however, instantly removes the symptoms; and a few repetitions of it on the successive returns of the paroxysm, in two or three days happily terminate the disease, with none or trifling aid from medicine.

In advanced periods of the disease, the author commonly employs water only fifteen or twenty degrees below the natural heat of the human body. After the eighth or ninth day he often simply sponges the whole body with tepid vinegar, to which he sometimes adds water. But where the heat has remained considerable, and where the *sole object* has been its removal, he has still persisted in the tepid aspersion.

Hence another limitation occurs to the author's general doctrine; for the cold affusion is to be changed after a certain number of days for the tepid, and the tepid affusion in various cases is to give way after a time to moistening and washing the body.

Since cold, cool, and even tepid water, employed externally, each reduce the patient's heat; we see why this heat should not be too low at the moment, lest too great a chilliness should follow. Hence also the same patient, whose disease has been removed by cold water judiciously applied, would often suffer from repeating the application in his convalescent state. But if we think we perceive why this rude remedy answers so happily at the delicate moment of the hot fit; we are still to inquire, whence it often removes the *whole of the disease*, of which the heat seems to constitute only a part?

Dr. Currie, as might be expected, has extended his trials with water to other species of fever. One species

and one alone, he has found in every shape insensible to his great remedy, of aspersion with *cold* water; but this species was generally insensible also to every other remedy, and was *not made worse by cold water*. This fever occurs, he says, chiefly in the winter season; and in persons who are in the flower or vigour of life, and who are also possessed of considerable sensibility of mind, and are in habits of more than ordinary mental exertions. Other particulars of this complaint must be looked for in Dr. Currie; who is the first perhaps who has noticed it, as a distinct species of fever; to which indeed it seems to lay claim, not merely by its refusing to yield to his applications, but by its symptoms; and particularly by the acuteness which prevails in all the senses of the patient, beyond perhaps the state of nature, and certainly beyond what occurs in common fever.

In *intermittents*, the cold affusion with vigorous patients, applied *before* the period of the *cold* fit, has prevented the whole of the fit; but where weakness made the attempt hazardous, the cold fit was suffered to arrive and pass, and the affusion was applied to the hot fit when thoroughly formed. The disease was sometimes cured in the first case; but in the second, there was only a solution of the pending fit; though four or five repetitions of the practice finally removed the disease. In any event, opportunity was given for throwing in medicines.

Dr. Currie has found not only that eruptions on the surface of the skin, but that salivation, are no obstacles to the cold affusion, under the restrictions before mentioned.

A friend of his has tried it also in the first commencement of *scarlet fever* (scarlatina,) and with complete success. The efflorescence on the skin and the affection of the throat were even prevented; which has led Dr. Currie to consider the tendency to these symptoms as being the *effect*, and not the *cause*, of this fever. Dr. Currie having had no late opportunity of treating the scarlet fever in its early stages, has contented himself with prescribing for it in its later stages, immersion in the tepid bath, heated from ninety-two to ninety-six degrees of Fahrenheit.

In the eruptive fever of the *small pox*, Dr. Currie has found a new object for the successful use of the cold affusion; regulating himself as usual by the actual state of the patient's heat, as appearing from the thermometer,

provided the indications of the thermometer are confirmed by the patient's *sensation* of heat. In the confluent small pox, after the eruption is completely formed, he is diffident of its benefit. But he is the more anxious to apply it in the eruptive fever, since he says that the assimilation of the quantity of contagious matter produced from the first contagion, is invariably found to bear an exact proportion to the eruptive fever. He declares that in the eruptive fever, he has instantly abated the symptoms, however severe, and that the disease has assumed a benignant form. He tells us, that the Chinese are stated to have long followed this practice with success.

Dr. Currie treats of *cold water applied internally* in fevers. He says that in the cold stage, it is never to be employed, however urgent the thirst; which ought only to be gratified in this stage of the fit, or paroxysm, with warm liquids. When the hot stage is fairly formed, and the surface of the body *dry and burning;* cold water, he says, may be drank with the utmost freedom; and if it succeeds, in lowering the pulse and heat, as is usual, perspiration and sleep commonly follow. Its effect however is never so powerful, according to his experience, as to dissolve even the existing fit of the fever, and much less the fever itself. But he holds draughts of cold water as an useful auxiliary in these cases, and says that they may be used more freely in proportion as the heat is more advanced above the natural standard. He allows cold water to be drank, though more sparingly, even in the *beginning* of the sweating stage; since it may promote the flow of perspiration; which after it has commenced, seems to be checked, if a fresh *increase* of animal heat occur. But after the perspiration has become general and profuse, the use of cold drink is strictly forbidden; the rule being, in all other respects, the same as laid down for cold water used externally.

In case of *injury from drinking cold water,* the author recommends hot water to be applied in a bladder to the pit of the stomach; and small and frequent doses of tincture of opium to be administered, which Dr. Rush recommends in cases of injury from cold water drank in warm weather.

Though Dr. Currie is persuaded that injury has sometimes followed from cold water drunk in hot weather, and from cold bathing used after strong exercise; yet he denies that any inconvenience is *necessarily* to follow.

He affirms, that inconvenience arises only for the want of making proper distinctions. In situations where the body, after having been much heated and enfeebled by severe exertions, is losing its surplus heat by perspiration, and in general by a cessation of the exertions which caused the heat; he allows that cold water, whether applied inwardly or outwardly, may often be injurious and sometimes even fatal. But while the surplus heat is kept up by a continuance of the exertion, he says that cold water may be drank safely in moderate quantities. The same he asserts respecting the cold bath; and therefore he has for some years constantly directed infirm persons to use such a degree of exercise before plunging into the cold bath, as would produce some increased action of the vascular system, with some increase of heat; and thus secure reaction under the shock. It will appear, however, that the patient here ought not to perspire; or if perspiring, ought not to stand still, either dressed or undressed, sufficiently long to become chilled from the effect of the act of perspiration, or from the evaporation following it.

Under the above persuasions our author contends against Dr. Rush; that where the party is warm, *no* attempt should be used to reduce the heat, previous to drinking cold water. It follows however from Dr. Currie's own premises, that no objection occurs either against removing the chill from the water, by means of the sun, of common fire, or of animal heat; or against continuing to exercise for a short time after the draught: and as either of these expedients is simple, it would be well to employ one or both of them; as the sole object in view is quenching the thirst, and not curing a disease upon speculative principles. We may here also observe the benefit of wearing cotton or even woollen next to the skin, where perspiration is probable from hot weather or violent exercise, especially where both are combined; since wet linen aided by evaporation, conducts away the heat of the body so rapidly, in certain situations, as often to occasion severe chills. Few however are the cases, in which it will not be safe and highly adviseable to throw off the wet linen, rub or wipe from the skin the matter perspired with something dry, and put on a fresh and dry covering next to the body; as those who have had experience in the case, will cheerfully testify.

As to using the cold bath when the body is warm, there are so many facts on both sides of the question that it requires an expedient to reconcile them; and this Dr. Currie certainly seems to offer. By his means, we perceive whence the Roman youth could plunge in the *course of their daily exercises* into the river Tiber, and yet Alexander suffer from throwing himself into the river Cydnus, after being fatigued and chilled with perspiration; as well as whence the Russians and others jump from a vapour or hot bath into the snow, or into a cold bath; while merely to sit in a cold stream of air, after violent exercise, is sufficient to bring others, nay the very same people, to the grave. A number of other seemingly contradictory, and yet authentic relations, receive here also a similar solution. Hence we may assure ourselves, that if the waters of the Mississippi never injure those who drink them in summer, whatever be their state as to perspiration or fatigue; it is not owing to the *quality* of these waters, but to their *warmth*, in consequence of their long exposure to the sun. In like manner, if the water issuing newly from the ground in Abyssinia, is harmless in all cases; it is because the spring-water of that country (which every where nearly corresponds with the average temperature of the weather of the place) is never very cold.

But we pass on to new cases of disease.

Before and since the year 1790, the author has witnessed thirteen cases of tetanus (that is, stiffness accompanied at intervals with convulsion, as instanced in the disease known by the name of the locked jaw.) This disease is distinguished into the proper or primary, called idiopathie; and the concomitant or secondary, called symptomatic, being an occasional attendant upon wounds, especially in hot countries. The author from his later experience, is disinclined to use the cold bath in any of its forms in the *symptomatic* tetanus; unless in the earlier stages of the disease, when the vigour is less impaired, and the disease less rooted. One reason is, that change of posture is required for the purpose, in a case where the mere action of the will on the muscles is often alone sufficient to bring on a general convulsion. He rather prefers wine given in large quantities, a remedy first introduced by Dr. Rush; but wishes it combined with very large doses of opium. Wine, it seems, has in this disorder been given with success also to horses; but it is

queried, whether other strong or spirituous liquors would not answer as well. It is observed that the constitution under this disease, powerfully resists the intoxicating quality of the wine and opium. In tetanus also, Dr. Currie has applied pressure, with evident good effect; moistening at the same time the bandages with ether, but taking care lest inconvenience should arise from too great an evaporation, the natural consequence of ether being exposed to a current of air. In the *idiopathic* or simple tetanus, the author has applied water of an exceeding cold temperature (exhibited in a bath where the effect was sudden, and the limbs could be stretched out,) with a very marked success, though all other applications had failed. Let us observe here, that since to rub in sweet oil has been found a powerful remedy with many, in cases of *cramp* of the external muscles; it might be well always to try it in tetanus, though medical persons often slight it. In any event, those subject to this painful affection of the cramp, especially pregnant women and swimmers, may do well to remember this use of oil. Oily substances may also be tried by the mouth or clyster, in cases of cramp or spasm in the stomach or intestines.

The author has applied a very cold bath to more than one case of insanity, with brilliant success; but it was when the fit was at the highest. The ordinary delirium of fever is acted upon by cold water in different shapes, in common with all the other symptoms of fever.

In children's convulsions, it is also serviceable; stopping the fit, and giving time for other remedies. When the author mentions that convulsions may sometimes arise from worms or other causes; perhaps he ought to have added, that teething is one of these causes, and that John Hunter has given instant relief, by cutting the gum over a young tooth with a lancet. On the whole, Dr. Currie recommends caution in the applications of water in early infancy; sometimes tempering his water, and sometimes only pouring it on, in preference to bathing in it; but making the operation sudden and transient, and providing means ready for securing the re-action, and even omitting it altogether when little vigour is left. But with these precautions he has seen great benefit resulting from the application of cold water.

In cases of St. Vitus's dance he has found no encouragement, for a reason hereafter to be mentioned; but

he recommends electricity in this complaint, as one of the few in which this operation seems advantageous.

He promises us little from his remedy in the case of epilepsy, where his experience does not seem indeed to have been extensive. Instead however of his own favourite remedy, he mentions benefit derived, in a case of periodical epilepsy, from a plaster formed chiefly of tobacco, applied near the pit of the stomach before the expected attack. He has used tobacco also in two desperate cases of convulsion, followed by continued coma, (that is, sleepiness and loss of sense;) but it was in the form of a decoction applied, as a clyster, which he prefers to the fumes of tobacco; the quantity for the decoction being half a drachm of tobacco in four ounces of water. In epilepsy also he applies oxide of zinc (that is the calx of the semi-metal zinc;) and still more efficaciously the *digitalis purpurea*, or purple foxglove, concerning which Dr. Withering and others have lately written largely. The author might have added, that hartshorn or ether mixed with water and given during the epileptic fit, tend powerfully to shorten it.

But let us close the author's account of his treatment of convulsive diseases with the following general remarks, extracted from his work. The efficacy of the cold bath in convulsive disorders, is much promoted by its being employed *during the moment of convulsion;* or (as he afterwards chooses to express himself,) its chief benefit depends on its being used in the paroxysm of convulsion; its efficacy consisting in resolving or abating this paroxysm, by which means the return is greatly retarded, if not entirely prevented. This law or principle in the disease, the author tells us, bears analogy to the fact, that madness is best treated in the height of frenzy. He also remarks, that the cold bath seems without effect in every spasmodic disorder, (as St. Vitus's dance,) which does not rise to the height of convulsion. Lastly, he observes, that in cases of madness and convulsion, there must be no considerable wound or other lesion of structure; that the disease should not be too habitual, and especially so as to produce insensibility to impression; that the fit should have a *general influence on the frame;* and that the digestion should not be too much impaired nor the vigour of the circulation much debilitated, lest the action of the cold be too strong for the living powers.

"Cold water (says our author) cannot be used as a *drink* during the paroxysm of *convulsions;* and of course

we cannot shew the analogy between its external and internal use in these, as in other diseases.

"That its effects (he adds) taken internally, are most salutary, in a numerous class of *chronic* diseases, is however well known; though perhaps not acknowledged to the full extent of the truth. A considerable part of the virtue of mineral waters is doubtless to be attributed either to the diluting quality of the pure element itself; or to the invigorating effect of cold on the stomach, and through it, on the system at large. * * * In hypochondriacal, hysterical and dyspeptic* affections, cold water taken internally has produced the most salutary effects. Hoffman praises it in headach, whether arising from indigestion or some primary affection of the nerves of the head. The following case will shew the use of cold drink in certain convulsive affections." Here the author cites from Hoffman the case of a Jew boy, cured of violent convulsions in a fortnight, by drinking cold water frequently every day.

Dr. Currie applies the term *tepid*, to water heated from eighty-seven to ninety-seven degrees of Fahrenheit, where it is used for affusion; though water will seem to be warm to the body at some degrees lower, if used as a bath, for in this case the evaporation is excluded. The cold from evaporation is so considerable, that water in the warmest climates will chill the person moistened with it, if standing in a current of air in the shade.

The author finds the coolness remaining from the *warm* affusion (strange as it may be thought) as great, as that from the cold affusion; and perhaps greater; but the cold is less sudden and stimulating. Without inquiring into the author's reasonings, let us observe that he applies the tepid affusion to certain other cases where there is fever; provided the chief view is to diminish the heat, and provided there is no contagion present, nor any foul matter in the bowels, as likewise no local inflammation; for we must never forget that affusion is only recommended where the heat is *general*. Under these impressions, the author employs the warm affusion frequently with children; and he has used it also where the lungs were affected; and especially in his *own* case, during the hectic fit, in hereditary consumption. But inde-

* Dyspepsia, in general includes the obvious diseases arising from indigestion.

pendent of the possibility of the respiration being affected, he remarks that in hectic cases, the body soon parts with its heat, which is then seldom great, even in the extremities. He recommends, however, in any event to moisten the inside of the hands and feet; since from the sensation of heat in the extremities, great irritation follows to the system.

Dr. Currie every where insists, that when the patient feels chilly, neither affusions, nor wet sponges, of any kind, are to be applied; but he repeats, that the cold affusion (which he calls an *energetic* remedy) is not only the most effectual, but *safest* application, in many of the cases where it can be used; since the system often accommodates itself to a sudden cold which is general and stimulating, but shrinks from a cold which is slow and successive.

Water tempered from 75 to 87 degrees, (which the author terms *cool*) is recommended for febrile diseases; but more frequently for palsy and other cases of debility. If the system is to be strengthened, or if diseased associations (or habits) are to be broken through, the application is to be quick and brief; but if it is merely to allay heat, and there is no danger of indirectly affecting the respiration, it may be used more slowly.

Such are the principal uses of water here to be mentioned from Dr. Currie.—We may be permitted to add one of two to his list. In cases of strains, dislocations, or fractures, *cold water* employed externally has had the happiest effects: operating in the first case like a charm; and in the others, allaying inflammation and preventing swelling, till the arrival of the surgeon, who then finds less impediment in examining the bones. With bruises and burns, similar advantages perhaps may be expected. But in all cases, it must be remembered, that the application must be *immediate* and long continued, and used merely to the part affected; and the water changed whenever the cold goes off.

That the facts respecting the use of *cold water* in certain diseases, as detailed in these sheets, may seem applicable to the case of the inhabitants of the United States; the author of this abridgment has judged it proper to cite the following evidence of some eminent physicians of America, on this subject.

In the "History of the *yellow fever*, as it appeared in the city of New York in 1795, by Dr. Alexander Hosack,

jun. of that city," we are told that "the most certain and successful means [of cure] were, to wash the whole surface of the body with *cold* vinegar and water; and, immediately after, covering the patient with blankets, to administer such medicines as possess the effect of bringing on sweating. Of these, the spiritus mindereri and saline draughts of Riverius succeeded well; more especially if the warm drinks were continued; such as the infusion of snake-root, gruel, toast water, tamarind water, lemonade, &c. These were much aided by applying to the feet of the patient a warm brick, steeped in vinegar and covered in a flannel cloth wet with vinegar or spirits: the steam, thus emitted and diffused through the bed, had a wonderful effect in softening the skin and exciting sweat; especially where the *cold* washing had been previously employed.

"Some practitioners have prefered the practice of plunging the patient several times in a cold bath, and violently dashing the body with cold water. But simply washing the patient with cloths dipped in *cold* vinegar and water, was found much preferable to immersion;* both because it more effectually diminished the heat of the system and was less fatiguing to the patient. Experiments have proved, that repeatedly wiping and washing with water, in the ordinary way in which the operation is performed; diminished the heat seven or eight degrees more than simple immersion, or dashing it over the body with pails.

"The practice of cold bathing in fevers of this type, is not a new one, but was very commonly employed at Breslaw in Silesia; and of late years has been very successfully applied in the West Indies,† as well as in different parts of Europe, where diseases of this type prevail.

"Professor Gregory, of Edinburgh, and Dr. Currie, an eminent physician at Liverpool, have also prescribed it with great advantage in the low typhus fevers of those cities. But its great success in the *New York hospital*, as employed by Dr. Samuel Bard, and in the private practice of my *brother*, have fully convinced me of its use.

"It is also proper to remark, that where the physician was not called to the patient in the first stage of the dis-

* Before deciding here, we must consult Dr. Currie.

† See Dr. Jackson on the Diseases of Jamaica.

case, and putrid symptoms had appeared, and the patient had become much debilitated, the cold bath was injurious: and from the abuse of cold bathing, by employing it in the *last* stage of the disease, it has fallen into disrepute with some practitioners. But as the abuse of a thing is no argument against its use, I repeat my observation, that in the *first or inflammatory* stage of the disease, it was one of the most useful remedies that was employed.

"When the cold bath had been thus made use of, and immediately after followed by the spiritus mindereri or saline mixture, with plentiful dilution, it rarely failed to produce sweating in the course of fifteen minutes; and when once induced, it was easily continued by the repetition of the sudorific medicines and drinks, until a solution of the fever was obtained. In some instances, where the patient refused his drink and medicines, or from the carelessness of the nurses they had not been supplied as frequently as was proper, and the perspiration had been suppressed, it became necessary to repeat the cold bathing; which seldom failed to procure a return of the *sweating*. By the continuance of this discharge, an abatement of all the symptoms took place. It appeared to operate as a specific in the disease; the pulse in a short time become moderate; the heat of the skin diminished; the pain in the head and back, before so distressing, was also relieved; the sickness of stomach and vomiting were removed; and in the course of two or three days from the attack, the patient had little else to contend with but mere debility."

Thus far Dr. A. Hosack, jun. who, as we perceive, cites the authority of his brother Dr. D. Hosack, and of Dr. G. Bard, both of New York, in addition to his own. We must observe, that neither of these gentlemen, at the time of the publication of Dr. A. Hosack's pamphlet, had seen the larger work of Dr. Currie; of which the first edition appeared at the close of 1797, and the second in 1798. This work therefore merits an examination by itself, even by the physicians of New York. One of them, whose name has not yet been mentioned, but whose own productions are read even in the centre of Germany, mentions in a private letter, that Dr. Currie's work did not reach New York till the present year (1799.) He himself says of it, that "it appears to be a judicious and interesting practical work." But not to dwell upon an opinion given incidentally only, however weighty may be the judgment of the party; we proceed to other evidence.

An American physician, whose name is known in every part of the civilized world, states that "he can from the experience of five years, subscribe to all Dr. Currie's remarks upon the use of cold water in the disease which has lately afflicted * * * Philadelphia." He adds, "its efficacy is now admitted by nearly all our physicians.—It is so far from interfering with, that it aids the operations of bleeding, and mercury. Where cold water has been too feeble to compose the inordinate actions of the blood vessels, I have used *ice* with great advantage. When the head is much afflicted, I confine the ice in a bladder and apply it to the forehead. In a few minutes I have seen it abate pain, remove a delirium, and sometimes induce the most salutary sleep. Its effects are equally obvious when applied to the seats of *violent* disease in other parts of the body; provided none of those circumstances forbid its application which are mentioned by Dr. Currie."

In various eastern countries, we find cold water used as an instrument in medicine; the custom probably being derived to them from ancient times. Dr. Currie not only cites the example of the Chinese, but of others; and he especially refers to the treatment of the sickness of Sir John Chardin in Persia; and Dampier says,* that he himself was cured of a flux, by bathing daily in a river in some of the eastern parts of Asia. But it is not from the rude practice of the orientals, nor even from Hippocrates or Galen, who each employed cold water medicinally, that we are to expect nice distinctions in these cases. Such do not in general offer themselves suddenly even in our own times.

Dr. Wright made his experiment in 1777, and (as every physician ought to do where he has the opportunity) he made it upon himself. He has great merit; but that merit does not consist in having given us *sufficient rules*. In 1788, a part of the practice in question was established in the Liverpool infirmary; whence it spread into the town of Liverpool and its surrounding country. In 1791, Dr. Currie's colleague published an account of these methods in Dr. Duncan's medical commentaries for that year. Dr. Currie himself published another partial account in 1792. Dr. Gregory (the younger) of

* This fact is stated upon memory only.

Edinburgh, has spoken on the subject in his public lectures; and even in 1737 it was used in a vague manner in Silesia, though it is now probably neglected there. Various practitioners also have resorted to cold water in the West-Indies, and some likewise in the United States. But as the practice has not gained ground generally, and chiefly for want of the rules necessary to prevent mistakes, especially in the case of fever; we have sufficient proof of our obligations to Dr. Currie. What thanks would not be due to him, who should teach with certainty when to employ, and when to avoid *blood-letting;* and especially should he give so accurate a guide as a thermometer and the feelings of the patient as to heat, when confirming each other?*

The thermometer indeed cannot always be used by the country practitioner, to whom we shall soon suggest a substitute; but to others, who can more easily obtain this useful assistant, we address the following information.

Mr. John Hunter, in the London Philosophical Transactions for 1778 (see also those for 1779) describes a thermometer of his own invention and of Mr. Ramsden's workmanship; which was short, slender, and with so small a bulb, that he could upon occasion put the whole into a peacock's quill; even including the scale, which was moveable† and of transparent ivory, being in the form

* This was written before seeing Dr. Rush's late brief and simple rules for blood-letting.

The members of the three learned professions in America, notwithstanding the worth and well known talents of many among them, have long been liable to the reproach, of having contributed little to the progress of their respective sciences, by means of their *publications*. The American practitioners in medicine have lately relieved themselves from this charge, by some valuable works. Among the earliest of these *authors* we must certainly place the amiable and respectable Dr. Rush, who has so eminently contributed to excite an emulation among the medical students in his own state. Professor Mitchell, and others, have most happily introduced a like emulation into the state of New-York; which it is hoped will soon spread itself.

† A moveable scale admits the application of the naked thermometer in certain cases; and the observer by a mark on its tube, is easily enabled when the scale is afterwards restored to its place, to ascertain where the mercury has stood during his experiments.

of a hollow tube, and no where touching the bulb. The results of this thermometer differed from those of others before used by John Hunter, and even from his own expectations. It was this sort of thermometer which Dr. Currie employed with his patients; taking care to make the stem bend backwards in order to admit of his standing behind the sick, to avoid infection from their breath. Dr. Currie recommends as a farther improvement to add a guage like that used by Mr. Six, in his thermometers made upon the plan of those invented by Lord C. Cavendish. (See London Phil. Trans. for 1782 and 1757.) But a thermometer with spirits of wine (which sufficiently corresponds with one of mercury in the high temperatures here in question) would probably be visible enough to answer every purpose, were the spirits, as is usual, *coloured*; and it does not appear, why excessive diminutiveness is so necessary a quality in mere medical thermometers.

We have hinted that country practitioners must often be content, and may do sufficiently well, without thermometers; and especially in these parts of the United States, where thermometers are so seldom found corresponding with each other; and where, even if good, they are with difficulty replaced in case of accidents. The uses of the thermometer in Dr. Currie's system of practice are chiefly two; one to shew the heat of the patient, and the other the temperature of the water to be applied to him.

Let us begin with the latter subject. It is known to every practitioner, that boiling water is always of the same heat in the same state of the atmosphere. Next, it will soon be shewn, that water can always easily be found at hand at certain other known degrees of temperature. Lastly, rules may be given, for producing *any intermediate temperature* between that of boiling water and of water of any other known temperature, *merely by mixing them in certain proportions and with certain precautions.*

We shall now shew that water may generally be found of several temperatures, which are easily ascertained without the aid of thermometers. 1° In winter, water which has remained a certain time filled with ice or pounded snow, after it is poured off, will stand at the freezing point; or at thirty-two degrees of Fahrenheit's thermometer. Water will also stand at the freezing point; when taken from underneath a surface of thick ice, formed upon it in winter in a vessel of moderate

size.* 2° The average temperature of the air throughout the year may be known for any place; and this temperature is one and the same with that of the springs of the place when first issuing from the ground, and also of the earth of the place at a few feet below the surface. 3° The average temperature of each month also may easily be known for any place; and when known, it will commonly nearly mark the temperature of the water accidentally found in any considerable vessel, placed under shelter from the wind and sun, but exposed to the open air; especially upon making certain obvious allowances.

Enough then has been said as to the fixed points of heat at which water may be found and the methods by which it may be tempered by being mixed in different proportions at different temperatures, for the purpose of bathing, aspersing, or moistening the bodies of different patients according to their respective cases. Happily very great nicety is not found to be requisite; and perhaps the guess of the practitioner will always abundantly suffice. In this case, what has been said on these subjects will not be lost, since it will find its place with those attentive to *meteorology* and other branches of natural philosophy.

As to calculating the patient's heat, without help from a thermometer, in general, we may depend on the patient's feelings, the rapidity of the pulse, the precedence of the the cold stage of fever, the colour of the skin, its freedom from perspiration, the fulness of the face, and the marks of *universal* heat to the touch of the observer. That the practitioner may not be misled by the remains of heat which the bed clothes may have kept in the patient from a preceding hot fit; let the bed clothes be thinned with judgment and for a short time; and if the patient still remains hot, he will offer a new criterion as to his temperature. If other rules are wanting, the following are some which present themselves.

Take a short tube of glass, exceedingly thin, and with a very small bore, having one end open and the other closed. Having first heated it gradually by placing its *outside* in heated water, plunge its open mouth into a small quantity of spirits coloured with cochineal, or of aqua-fortis made blue by vitriol or copper; or if quicksilver is at hand, put it into a little quicksilver. As the air cools in the tube, fluid will rise into it; and when a

* Mr. Nairne instrument maker at London, first noted this fact, in itself so evident.

very short column (amounting only to a drop or two) has been taken up, we have an instrument suited to our purpose.—A cork may be placed in the open end, when this instrument is not in use, to prevent dirt entering, or the evaporation of the spirit or water; but the cork must be carefully withdrawn, to preserve the connection with the atmosphere, when the instrument is employed.* Let the practitioner place it during some time under his arm-pit, when at the sick bed; and, marking the spot then occupied by the column or fluid, let him wipe the instrument, and place it under the arm-pit of his patient. If the patient's heat be *greater* than his own, the air behind the column of fluid confined by the closed end of the tube, will now be most rarified, and drive the fluid farther out than with himself; if the contrary, the reverse will happen. This instrument must at some one time be compared with the thermometer, merely to shew how its scale of variation agrees with that of the thermometer, unless this can be guessed at by other methods. But the degree in which an instrument of this sort will be affected by the changes in the weight of the atmosphere, (for it is a species of barometer) render it necessary that the comparison of it with the heat of a healthy person, should always take place. An object to be farther attended to is, that the patient's heat be not only greater than natural, but at a high pitch even for *fever* heat.

Perhaps chemists may invent some compositions, which by their melting or effervescence may indicate fixed degrees of heat, which may be contrived to serve as standards for the heat of fever.

With respect to the standard heat of the human subject taken *internally* in a *state of health;* it varies with age, constitution, exercise, fulness from meals, and other circumstances, independent of disease. The usual average temperature is perhaps at 97; but eating, for example, increases it one or more degrees. In disease, according to Dr. Currie's observations, it sometimes in extraordinary cases, sinks as low as 92; and sometimes in cases equally extraordinary, it rises to 105. Repeated doses of the *purple fox-glove* have reduced the heat to 89, and the pulse to 32 in the minute. Dr. Currie constantly treats the heat under the tongue when the mouth is shut,

* Whenever the fluid employed is carried off by evaporation or other accident, it is easy to put in a fresh quantity, in the manner used for putting in the first.

and the heat under the arm-pit when the body is properly covered, as one and the same; and takes them for his standard of the internal heat. The experiments of John Hunter, Dr. Crawford, and others, upon animals whose bodies have been opened during life, prove that the heat within, near the heart and lungs, is greater than in the other parts of the body. But it is needless to repeat these cruel experiments, which can offer no guide with patients; the stations assigned by Dr. Currie for receiving the instruments to measure the internal heat, answering every purpose in the cases here in view.

Dr. Currie says, in a note; "I intended to have introduced one or two registers of the heat and pulse, taken every half hour, during the paroxysm of intermittent; but this is delayed, till I am enabled to speak from more numerous observations." Dr. Currie, it is to be hoped, will feel himself bound to fulfil this task. If these lines should chance to meet his notice he is requested by one who respects his benevolent zeal, as well as his abilities, to extend his views; and to favour us with a more accurate account of the internal heat of the human subject in all cases refered to in the preceding paragraph, short of *living* dissections.

To encourage him or others to labours of this kind (which are best pursued in large towns, particularly if possessed, as they are generally, of infirmaries,) we may be allowed to state something concerning the standard rate of the *pulse* in the human subject. The pulse offers an important criterion in fever; and the pulse of persons under given circumstances, when in health, furnishes a necessary point of comparison for the pulse of the *same* class of persons during *disease*. We shall follow in this, the good Dr. William Heberden; observing that he speaks of the pulse as it is found in England.*

Rates of the beats of the pulse in the human subject, during the course of one minute.

During sleep.	On the day of birth,	130 to 140;
	Through the first month,	108 to 140;
	Thence, during the first year,	108 to 120;
	Through the second year,	90 to 100;
Thence to the sixth year, decreasing,		80 to 108;
During the seventh year,		72 and upwards;
Thence to the twelfth year,		70 and upwards.

* See Medical Transactions published by the College of Physicians in London, vol. 2.

N. B. The pulse up to this age is more easily quickened by illness than afterwards.

Afterwards the pulse is from sixty to eighty; but in men, it sometimes goes to ninety, and in women even beyond ninety. Sometimes the pulse is below forty. It frequently likewise intermits.

After a full meal the pulse increases ten or twelve beats. But if it has ten pulsations beyond the natural rate of the patient's pulse, viewed as varying according to accidental circumstances, it indicates disorder.

In *disorder* during the first year, the rate may pass from one hundred and forty to one hundred and sixty; but want of sleep and appetite, with thirst and the state of the infant's breathing, are here better indications.

Sometimes one hundred and forty-four is a rate fatal at two years; but with others, one hundred and fifty-six and one hundred and fifty-two, are not fatal rates, at the age of four and nine respectively.

With children a reduction of fifteen or twenty beats of the pulse, accompanied with signs of considerable illness, mark an affection of the brain. With adults, a sudden abatement of pulse in fever, and an aggravation of other symptoms, equally indicate disease in this organ.

With adults, one hundred beats denote commonly no evident danger; but danger begins at one hundred and twenty, and unless there be delirium, all beyond is commonly fatal. The author excepts cases of acute rheumatism and cases previous to a deposit of matter; when there have been recoveries even at one hundred and fifty and one hundred and twenty respectively. He excepts also cases of *low fever* at ninety or one hundred; for here may still be danger.

It is hard to count one hundred and forty beats, unless distinct; but where distinct we may count one hundred and eighty in a minute.

Schirrous and ulcerous cases, with a hectic, are often for a long time from ninety to one hundred and twenty.

Great pain in certain cases, does not quicken the pulse; as is instanced with gall-stones.

It must not be forgotten in disease, as well as in health, that women sometimes have quicker pulses than men, other things being equal.

Thus far we collect from Dr. Heberden.

A practitioner wishing to pursue observations of this kind, may not always be provided with a watch beating

seconds; and, in these parts of the United States, he cannot always be certain of access even to a pendulum clock. It may therefore be convenient to know, that in these latitudes, a pendulum beating seconds, may be made of a *very fine* thread and a *small* leaden ball; extending in the *whole* about thirty-nine inches and two tenths, from the point of suspension; which point we will suppose formed by a very strong dressing pin. Theoretically, a pendulum should be somewhat shorter in these latitudes; but the above total length will answer for practice with a pendulum of the above description. The habits of astronomers shew, that it is easy to learn to *count seconds* by memory. The practitioner who is able to do this, may, in certain cases, station one upon whom he can depend, to note the pulsations which have occured in a patient, while he has been counting apart a certain number of seconds. It can be of no disservice also for a patient to learn the ordinary rates of his own pulse, to tell to his physician in case of disease.

With respect to other indications of the pulse, in which not only certain individuals, but certain nations pretend to a peculiar nicety, we refer to the various authors who have written more or less expressly on the subject.

We do not follow Dr. Currie in his *history* of the theory of fever. We rather give his *own* account of the leading *symptoms of this affection*, when viewed independent of circumstances and under general characters, in order to accompany it with his remarks.

Fever begins with a languor of a *peculiar* kind, seen even in the countenance, and is followed by paleness, cold, and trembling, and (he should have added here) by a shrinking of the surface of the body; the action of the mind and of the whole system being enfeebled. The heart and lungs, being roused by the fluids now crowding inwards, soon press them outwards. A tightness or spasm, however, in the vessels at the surface opposing, the internal re-action becomes increased. If in the struggle, the stomach becomes affected by sympathy, a tendency to sickness ensues. At last, the powers of life prevailing, heat appears, first in one part of the surface and then in another, but with some fluctuation; till the hot stage becomes universal, when the vessels on the surface finally yield a passage to perspiration, though not always without a check. Such is the course of a single fever fit,

when it obtains a regular termination. But in cases of *continued* fever, both the spasm and heat remain longer; till at length as the patient weakens, the spasm decreases so as to admit of perspiration, and the heat is sometimes brought almost to its natural state; the quickness of the pulse alone persisting, as the *effect of a habit* produced in the course of the disease. Thus he says, when a hot room or bath raises the heat in the human subject four or five degrees, and most of the other symptoms of fever appear; yet after the external heat is removed, and the internal heat becomes natural, the increased pulse still continues; which he attributes to the principle of association, peculiar to life and pervading the vital phenomena, intellectual and corporeal. The author from the same case of artificial heat proves the existence of *spasm;* since perspiration follows this heat so plentifully, as to make it difficult to increase the internal heat beyond one hundred or one hundred and one; whereas at the same temperature in fever, perspiration is often refused. He observes also, that both in hot fever and in the sudden increase of heat in health, the tightness of the vessels at the surface often exists: but when the heat abates, it disappears so as to admit of perspiration; the spasm in the case of health being the result of a resistance to a violent stimulus. This resistance he calls another law of the living system, belonging to every species of vital action, whether of mind or of body.

In these circumstances, he conceives that the general and powerful spur or stimulus of cold water dissolves the spasm or tightness; perspiration and evaporation now succeeding, which naturally tend to reduce the heat and pulse. Whether the cold as a new stimulus *aids* the stimulus already existing in the blood vessels; or whether the cold acts by dispelling or by *counter-balancing* the spasm on the surface; or whether these causes stand more or less combined, will not here be disputed. Certain it is, that the *cold* of the water operates more than its *moisture;* because warm water in general less easily effects a cure, even when producing a greater coolness through its longer application; though it is possessed of those additional chemical powers for dissolving or penetrating substances which are derived from heat. On the other hand, even sudden cold reduces the animal heat, chiefly by affecting the body as consisting of organized living matter. Hence a variation in the effects, both tempo-

rary and permanent, of the cold and other affusions, &c. whether we compare these effects with themselves or with each other, in cases similar in a mere mechanical view.

As to the diminution of *thirst* following the cold affusion on the surface, Dr. Currie by no means admits that much water is ever absorbed by the skin; and therefore attributes this diminution of thirst to the removal of a spasm in the mouth, jaws, and stomach. Whether it be the removal of spasm or something else which is effected within, will not be discussed: it suffices, that *a sympathy obtains between all these parts.* It is no less true, that thirst is allayed by a draught of fluid before it can have entered the circulation; as likewise, that perspiration often as immediately follows.

The author (as has been hinted) attributes the reduction of heat by the tepid affusion, to cold arising from evaporation; but as this stimulus is always slight and necessarily transient, the heat ultimately returns and the effect becomes merely palliative. Even the cold affusion cures at once, only in the early stages of disease; and though uniformly advantageous while the morbid *heat* continues, its effects are less decisive when morbid associations have once been produced.

What then, says Dr. Currie, ought to be the *indications in the cure of fever?* To diminish the cold in the cold stage; to moderate the heat in the hot stage; to resolve the tightness or spasm on the extreme vessels; and, where the inordinate action of the vascular system still continues, to support the powers of life, till the diseased associations die away from the ceasing of their causes. It is also essential, to secure the proper action of the bowels; and, in every case, to unload them of their morbid contents, whether these are the effect or the cause of the disease.

It is a serious error, according to Dr. Currie, to suppose that febrile poison received into the system, is the principal cause of the *symptoms* of fever; and that these symptoms consist in a struggle of nature to expel the poison. It is safer to consider the poison, as an agent that *excites the system into fever;* the fever being afterwards carried on, not by the agency of this poison, but of the principles which regulate the actions of life. We are not therefore to wait for a restorative process, by which nature is conceived to throw off the poison; but to oppose the fever in every stage with all our skill, and

bring it to as speedy a termination as is possible. By the powerful means of the cold affusion applied in time, the whole of the feverish symptoms vanish. Hence the safety and wisdom of decisive measures before the strength is materially impaired or diseased habits established.

Those who practice within the *tropics*, where fever runs its dreadful course with such rapidity, ought especially, he says, to be aware of this truth. They ought also to combat the disease not merely by cold affusions, (which whether supplied by springs or by the sea, can seldom there be below the temperature of 77 or 78 ;) but by actual immersion of the patient in a bath, or in the sea, supposing this at hand. The duration of the immersion he thinks must be governed by the pulse, by the sensations of the patient, and by the thermometer. He refers for the success of this practice to the case of Sir John Chardin ; and to that of persons, who in the delirium of fever, and chiefly in warm climates, have plunged into the sea, and who in every instance within his knowledge (where they have been saved from drowning) have recovered.* To increase the cold of water in hot climates, he refers to the well known artificial modes of cooling water. He also hints at the practice of alternately plunging the patient in water, and then raising him into the air, where the wind blows over his naked body, farther to cool it ; but he says that the utmost care is necessary to guard against fatigue ; and we venture to add, that it will be prudent to have means at hand to remove both chilliness and faintness, should either occur. In the northern and middle latitudes of the United States, the effects of cold winters upon springs, furnishes cold water at all times ; and ice-houses admit of rendering it still colder.

In hot climates, to cold water for the surface, the author would add cold *drink* in large quantities, where the patient's heat will bear it, especially the heat within at the stomach ; and he considers a tendency to vomit as no objection. He confirms his opinion by the practice of the ancients, by the treatment used in the Hungarian fever (which he holds as resembling the yellow fever,) and by the recommendations of Hoffman in bilious vomitings and dysentery.

* See a remarkable case of this kind in the London Phil. Trans. for 1786, p. 190.

We now proceed to glean a few other *detached particulars* from the author's work, which are either theoretical or conjectural; or have no immediate relation to the use of water; or have not before been sufficiently noticed.

The author wishes both cold water and cold drink to be tried in the case of the *plague*, should the heat in that disease be considerable; but if it is no greater than in the confluent small pox, which is little, if at all above the natural standard, he has little hope.

The best explanation which he can give of the success of his favourite remedy, in *convulsive diseases and in insanity*, if applied at the moment of their *height*, is taken from John Hunter and Dr. Darwin; namely, that no *two* great actions seem to take place in the human constitution at the same time; and that if the balance of vital energy can be turned in favour of a shock from cold, it will supersede the disposition to the diseases in question at their critical moments, and thus break through their associations. Tobacco used in the *crisis* of epilepsy, is another instance with him of the benefit of employing, in these cases, the balance of power in one stimulus over that in another. From both these remedies thus respectively applied; the good effect he says, has repeatedly been *permanent*.

In *cooling the surrounding air*, or in any other application of cold, in fever; care must be taken to watch the limits within which it is grateful to the sensations; in which case the author's experience has *uniformly* shewn it to be advantageous.

It is believed that the author somewhere speaks of a wet blanket having been used with success. Dr. Crawford certainly gave temporary relief even from delirium, to a patient in fever, by this means; and nothing but its being used too late, seemed to have made it a palliative rather than an effectual remedy.

The author says, that the action of cold may be conveyed over the whole system by its application to a single part; as when cold substances are applied to some single part, to *stop bleedings*. Hence, for bleeding from the lungs, he has dipped the feet in cold water; though he thinks that it might perhaps have been better to have applied cold permanently to the scrotum, &c.; and he has often here found it safe and efficacious to plunge the patient into cold water up to the hips. In all these in-

stances, the application of cold must be both powerful and permanent.

The same rule as to permanency and degree, is necessary for cold applied *locally* to parts which are *inflamed*. Thus even ice, snow, and the clay-cap, are successfully employed, not only for reducing, but *preventing* inflammation; the sensation of cold in the parts acted upon, speedily subsiding.

He does not apply cold to local inflammation, *if attended with fever*; chiefly, because in such cases there is too great a sensibility to cold and indeed to other stimulants; but this is a subject which he avoids treating at length.

He extends this objection however to *measles, catarrhs,* (or colds,) &c. and he is not persuaded that cold can be useful in *pleurisy or peripneumony*. Yet in inflammations of the *brain, stomach, intestines,* &c. and especially if desperate, he thinks the cold bath should be hazarded. But *in all inflammatory cases,* he inclines to judge it proper to moderate the cold, if employed. Besides sinking for example, gradually, into the cold bath; the state of the pulse and of the heat is to be examined; though the author remarks from his own case, while in health, that the heat within the trunk of the body is wonderfully sustained in the cold bath, notwithstanding it is speedily and permanently lessened at the extremities.

The *House of Recovery*, instituted in May, 1796, at Manchester, in England, affords a singular instance of success in preventing infection throughout a large town; and merits a short abstract from our author. Into this asylum on the first notice of fever, the patient is removed; and proper methods (being in part chemical) are taken to purify his habitation. The prevalence of fever has hence diminished to a degree beyond all rational expectation; and the fears that the institution might spread contagion in its particular neighbourhood, are found groundless; since not one case of fever appears there for ten or fifteen cases which prevailed there before. About one in nine only of those admitted, die; and as the result has made considerable impression, it will still farther greatly reduce both the deaths and the danger of contagion, should the poor apply in the *early* stages of the disease. The importance of such an institution, in great towns, may be known from two other facts related by Dr. Currie; First, the apartments for fever-cases, in the Liverpool work-house, are in the very centre of the

building, and cannot be entered except through the common stair-case; and yet not a single instance is known of contagion spreading thence, to the other patients in the house. Secondly, the number of fever-cases annually presented to the medical attendants at the Dispensary at Liverpool (a town with a population resembling that of Philadelphia) is above *three thousand;* and the average duration of the fever is about fourteen days, besides fourteen days consumed in the recovery, where the recovery happens. The fever-cases, in short, make nearly one fourth of the whole number of maladies; the loss to the public occasioned by which may easily be conceived. In Liverpool (and this is another remarkable fact) eighteen hundred cellars are inhabited by about seven thousand persons, besides nine thousand who live in close and confined houses; and many of these persons taste no animal food; tea being generally drank, once, if not twice in the day; from which causes principally, and the use of spirits, above five hundred patients, who are chiefly females, are annually found among those applying to the dispensary on account of *diseased digestion.*

When our author, however, in speaking of the above institutions, affirms with Dr. William Heberden, that cold winters are unhealthy in England; and states that the most unhealthy moment is that when they are exchanged for warmer weather; an inhabitant of these northern parts of the United States cannot but indulge a smile. Perhaps in no part of the civilized western world, is the entire severity of a cold winter *actually* more fully braved, than in these parts; nor can a more sudden transition from heat to cold easily offer; and yet *in no one country in the known world,* is there less disease, or fewer deaths, upon a given number of inhabitants. This fact, and especially in a comparative view, merits a particular attention, which will perhaps be given to it on a future occasion.

The common treatment of fever by the gentlemen belonging to the Liverpool dispensary (which is distinct from the infirmary) consists in giving first, antimonial emetics; and then, bark, opium, and wine; nourishing food being occasionally administered; but seldom washing with cold water (which would indeed be difficult in the cellars where this disease is usually found.)

Dr. Currie will now offer some more particular and interesting information on the use of opium and strong liquors in fever.

Dr. Currie, treats of *opium*, pursuant to the engagement in the title to his work; viewing it as administered in health and in fever.

In a state of *health*, if the mind is vacant and external objects excluded, and provided also that the stomach is empty; opium usually procures sleep. This sleep is preceded by agreeable sensations, happy slumbers, and gentle perspiration; the surface and extremities of the body acquiring the same heat with the internal parts. As the full sleep approaches, the pulse quickens, and the breath becomes slightly irregular; but when profound sleep has actually arrived, the pulse abates to its slowest rate; while the breathing, besides growing slow, becomes regular also, and deep.

In *fever*, if the heat reaches or exceeds one hundred degrees of the thermometer, with a dry skin; opium *commonly* seems to add to the heat and restlessness. When the skin has softened, and the heat, though still great, is yet subsiding, opium often accelerates the perspiration; and by this means, diminishes the heat; in which case tranquillity and sleep generally follow.

Hence, in the case of *continued* fever, which is commonly greatest in the evening, and is then accompanied with two or more additional degrees of heat, an opiate (or anodyne) may injure at night, and yet do service at two or three o'clock in the morning. Hence also in continued fever, it may be proper to lower the temperature of the surface and prepare for perspiration, by cold or tepid affusion or drink, (applied according to rules) before giving, or even after giving, the opium. In *intermittents*, on the other hand, where the disposition to perspire is more easily excited, opium may be given with fewer precautions; though if administered in the hot stage, its salutary effects may be much promoted by moderate draughts of liquids; which should be cold, if the heat is great.

The author conceives water to be a better assistant to opium in procuring perspiration, than ipecacuan or antimonials; except in inflammatory diseases and in dysentery. His dose of opium is two or three grains of the extract, or from ten to sixty drops of the tincture; for he finds that a very small quantity judiciously applied, will produce considerable effects; and he thinks that whatever is beyond necessity, it would be unwise to employ.

Alcohol is another of the topics standing in the title to Dr. Currie's work; by which term, he does not mean, with common chemists, spirits of wine; but vinous and spirituous drinks. Alcohol (or strong drink) he says, is more heating than opium, and has less tendency to produce perspiration and sleep; but yet has a striking resemblance to opium in its effects.

In *health*, like opium, if the mind is vacant, and external objects excluded, and the stomach empty; strong drink inclines to sleep. But as sleep approaches, the heat of the body rising throughout and the pulse quickening, an agitation follows, which is often opposed to sleep. If the dose however has for the moment stupified all sense, still on the first return of sense, the drunkard is roused from his apoplectic slumbers by intolerable heat; amounting in one case (that of Dr. Alexander, who tried the experiment on himself) to one hundred and seven degrees; and this is accompanied with thirst, agitation, and consequent weakness, as also with obstructed perspiration. The author here, as perhaps in all other cases, where there is heat and a dry skin *without* local inflammation, would prescribe large draughts of water, or the affusion; which is likely to prove more effectual, if cold, than if warm. Opium, where the skin softens, favours perspiration in the drunkard; and sometimes, and perhaps by this very means, affords remarkable relief.

In *fever*, strong drinks must be given with the same precautions, as opium; that is, be avoided in cases of great heat and a dry skin; and reserved for those cases, where the heat is only a little above the natural standard; unless perspiration is certain, when they may be used in a heat somewhat beyond the natural.

Such are the author's remarks on opium and strong drinks. They are offered only with a view to fever; and he so little considers them as complete, that he proposes to resume the subject.

In the author's title page stands another topic yet unnoticed by us; namely *inanition*, or abstinence; and along with it, he handles another important, as well as long disputed point; namely, whether fluids, and consequently nourishment if wanted, can *pass through the skin*.

A part of his conclusions on the subject of inanition or starving, are drawn from a case where a scirrhous tumor took away the power of swallowing. The heat and in

general the pulse were natural to the last; the spirits even; the intellect good; the strength sufficient for walking about the house; neither hunger nor thirst on the whole troublesome; but after a certain number of weeks, a distortion of vision was followed by delirium and other symptoms, which closed the scene. Nourishing clysters gradually increased, in which liquid laudanum was largely mixed, especially in the evening, together with a warm bath of water and of milk, were the only applications. Another patient whose power of swallowing was destroyed by a different disease, used the clysters, but omitted the bath; and never complained of hunger, nor always, nor very much of thirst; his pulse being good, unless previous to death, which in him was easy and accompanied with the perfect use of all the faculties.

Hence the author remarks as follows; 1° A regular pulse is no certain indication of the system being in order. 2° Vital heat is not principally owing to digestion; the increase of heat after food appearing to arise from the influence of the stomach on *other* parts. 3° As the first patient did not easily recruit his heat, when heat was taken from him, the power of doing this is to be held in proportion to the force of the living principle; (and this is a fact which might before have been infered from the experiments of John Hunter in the papers already cited, in the case both of vegetables and animals; which Dr. Currie at the moment seems to have forgotten.)

We come now to some particularities respecting the *passage through the skin*, to which the first case leads us. The patient in a balance sensible to the amount of a drachm, was found to have had *no difference produced in his weight by using the warm bath*, in three instances where the trial was made. According to the rate at which his body wasted from day to day, during many days, he ought to have lost five sixths of an ounce during the time he spent in the bath: but he appeared neither to have lost nor gained. He seemed indeed to perspire; but the author conceives the appearance to have been owing to the vapour of the bath resting on his forehead. At the heat of eighty-two in the public baths at Buxton, in England, the author (with various others) has found no change of weight: in other experiments he has found

no change in himself in baths variously heated between the temperatures of eighty-seven and ninety-five; and in several cases of the diabetes, (where indeed a disease in the skin according to him usually occurs) the warm bath has produced no change of weight.

These experiments do not countenance the common supposition, that in case of a deficiency of liquids at sea, thirst may be prevented by wet penetrating *inwards* through the skin. The author is indeed aware of several conjectures to be urged in favour of this supposition; as for example that what is taken inwards may not shew itself in the weighing machine, from being counterbalanced by what escapes outwards; and that fluid may be taken inwards at lower temperatures than those of the warm bath. But he inclines to overlook these conjectures; and he likewise dissents from the experiments of Dr. Falconer and Mr. Abernethy, as made only on a part of the human body at once.

He is strongly inclined to think, that though certain vessels* in the skin afford a passage *outwards;* yet that the absorbent vessels lie below the skin, and never take up any thing from *without;* unless in consequence of mechanical pressure, or of a wound or a disease in the skin, or of the destructive nature of the matter applied to it. He explains therefore the benefit derived in certain cases from wetness at sea, either to the coolness produced; or to its preventing the wasting effects which would attend evaporation, could the air have access. The removal of the thirst, he attributes to a relaxation of those vessels in the skin which pass outwards, having effect on the vessels of the stomach by sympathy; just as perspiration in fever abates the thirst, without the aid of drinking.

* He conceives with Dr. G. Fordyce and Mr. Cruikshanks, of London, that the matter of the perspiration is separated from the blood by the capillary arteries, and then thrown out by organic pores existing in the cuticle (however difficult to be discovered) which are connected with the extremities of these arteries; and he supposes that in this process, there is not a separation merely, but a new combination; during which a loss of heat may take place, accounting for a part of the coolness attending sweating.

But some experiments made in France by M. Seguin, the coadjutor of the celebrated Lavoisier, which are related by M. Foureroy, prove the necessity of a new examination of the whole subject. In low temperatures, as from about 54° to 59° of Fahrenheit, the loss of weight in the human body, says M. Seguin, is much greater when the body is exposed in air, than when it is exposed in water; because, according to him the *air* in the latter case, cannot, pursuant to its office, dissolve the perspirable matter on the skin; so that a loss of weight can now only arise from what escapes through the lungs. At about 70°, the disproportion of loss somewhat increases; as the air entering the lungs, from having been previously loaded with the moisture of the bath, does not so rapidly dissolve the perspirable matter in the lungs. At 90° and upwards, by the increased action of the heart and arteries, sweat flows from the skin, and lessens the above disproportion; which from being about three to one in favour of the air, becomes now only as about two to one. But in no circumstances, does M. Seguin find any absolute increase of weight in the bath.

To decide however more precisely whether absorption through the skin occurred in water, M. Seguin dissolved in water a preparation of mercury, in which different venereal patients bathed their feet, and apparently without taking any of the mercury into circulation; unless where the skin was broken, as in the itch, &c. At last he directed his experiments upon himself, as a person in health; bathing a part of his arm in water containing a preparation of mercury; and covering the glass which held it, as also his whole body, his *mouth* excepted, with gummed or with waxed silk according to the case. In low temperatures, he found no effect. At about 72° of Fahrenheit, mercury was taken into the body, but no water; whence he concludes, that the lymphatic vessels did not perform this absorption, since they would more readily have imbibed the water. When the heat of the bath was pushed on nearly to blood heat, even mercury was no longer taken up. Hence the author supposes that the mercury when the water was at 72°, penetrated into the drops of sweat slowly moving outwards and thence into the body; which could not happen, when the drops of sweat rolled out faster, in greater heats.

When other substances act through the skin. M. Seguin in effect explains the case nearly as Dr. Currie. He de-

cides also from these experiments, that contagion acts through the air and lungs, and not through the skin by contact; that the diabetes arises from water left in the lungs; and that dropsies occur from the absorbing being stronger than the exhaling vessels, (the absorbing being supposed to operate only on what is *within* the body, including what is found in the lungs.) Some of his other conclusions do not seem to regard our purposes.

Upon a *comparison*, it will appear, that in Dr. Currie's experiments, no weight was lost in the warm bath, at least that was discoverable by his weighing machine; but that in those by M. Seguin, weight was actually lost in the bath, though less than was lost under the same circumstances in the air. Surely these matters require elucidation, and happily they may be pursued by any person in any country. Indeed our inquiries demand to be extended to many other objects still more familiar. So simple a fact as the state of heat in starving persons, (supposing the cause of the ambiguity not to be in the nourishing clysters) is still the subject of dispute; and the same as to the heat in the diabetes. And Dr. Currie has perpetually to complain, that the heat is little observed in any disease whatever.

Whoever inquires experimentally into the comparative weights of the body and of the powers of the skin, will of course seek to consult Sanctorius and other celebrated authors; but let him not overlook the English Dr. Stark, of whose experiments Dr. Franklin was so fond. Dr. Stark, like many others in Europe, exposed his life in medical researches, and would himself have been more celebrated, had not his zeal brought upon him a premature death. Lieutenant, (now Admiral) Bligh has given a relation of a famine at sea suffered by himself and his companions, which deserves particular consultation; for he was left adrift in a boat in the Pacific Ocean, during six weeks; in consequence of a mutiny on board his vessel, which was conveying the bread-fruit, spice, and other plants, to the British West Indies. Nor will Dr. Franklin's remark be useless, as to the *loose texture of the skin*, after having long remained immersed in water.

The practice of *anointing* the skin among some of the ancients who were *fully* clothed, and among many nations ancient and modern using *little* clothing; also calls for attention. Unction with them seems a custom alike

prevailing in warm and cold weather. If new principles are called for to explain these usages, modern lights and modern accuracy will probably lead to them.

Dr. Currie connects the *warm bath* with the subject of *unguents*. He says, that the warm bath is used in the French, and is beginning to be used in the English West Indies; and he supposes it salutary after exercise; and that it restrains profuse sweating, keeps up the heat of the surface and extremities so as to prevent re-action in the arterial system, and sooths the sensations; but he adds, that on leaving the bath, friction should follow, with the anointing of the surface to prevent evaporation. To this system, however, he would join flannel clothing next to the skin, after the Greek and Roman manner. Perhaps these things should accompany each other; but without going so far, it is clear that cotton would be useful next to the skin both in hot and in cold countries; pursuant to the boast of the English cotton manufacturer, who says that whoever uses cotton *once*, never quits it. The use of oil is also proper for swimmers; and among other reasons (as Dr. Currie remarks) that the body may glide more easily through the water, as well as to guard them (as we have added) against the cramp.

Dr. Currie thinks that the perspirable matter of Europeans is not well fitted for the torrid zone, as being too liquid; adding that the sweat of the negro is unctuous or oily. Has he or others made the comparison in a scientific view; and taken the case of the Hindoo and other Asiatics, with that of the original Americans, into the account? The question demands to be treated with caution.

Dr. Currie, in a paper in the *Appendix* to his work, speaks of a *ship-wreck of some Americans near Liverpool;* adding remarks on the influence of fresh and salt water, hot and cold, on the powers of the living body immersed in it: the article being extracted from the London Phil. Trans. for 1792.

It appears as to the Americans, that two who died early during the accident, suffered from an alternate exposure to air and to water (both salt and fresh;) that others survived, who were more plunged in the sea, one excepted, who was desponding, but who died later; and that he who suffered least, was a black, who was covered to the shoulders in the sea. The sea was about

thirty-five degrees in its temperature, according to the author's present conjecture. The air was probably still lower, and attended during part of the time with sleet and snow and a piercing wind. The stay on the wreck on the whole was twenty-three hours. The two who died first, were delirious, none were ever drowsy; but all were thirsty and hungry. Mr. Amyat who related the story, had his hands and feet swelled and numb, but not senseless; his mouth parched; a tightness at the pit of the stomach; and distressing cramps in his sides and hips. Hence we may perceive the advantage of having been continually covered with the salt water.

This accident led the author into a train of experiments on what he esteemed the most fundamental power attending life; namely, the capacity of the body *to preserve the same heat under different circumstances.*

In his first experiment a young man who was plunged into a bath at 44° of Fahrenheit, had the thermometer under his tongue reduced from 98° to 87°; then raised gradually in twelve minutes to above 93°; but upon being exposed to the wind at 44°, though attendants were rubbing him, it fell again in two minutes to 87°; nor did he, though every resource was employed, entirely recover his heat under three hours. A second experiment on the next day, gave nearly the same result; as did a third on the following day; but in the third, the man was afterwards plunged into a *warm* bath on being taken out of the cold air, when the thermometer *sunk* two degrees. But the thermometer rose again more quickly than in the cold bath, and the heat was general over the body, and not confined (as in the cold bath) to the trunk alone. In a fourth experiment on another day, a longer stay in the bath produced inconveniences somewhat resembling those felt by Mr. Amyat; and great pain followed afterwards from a warm bath at 104°,* into which the party was too suddenly transfered. Three other

* In cases of this sort, "Heat (says John Hunter) must be gradually applied, and proportioned to the living principle; but as the life increases, we may increase the degree of heat." See his Proposals for recovering persons apparently drowned, in the London Phil. Trans. for 1776. Mortification arising from heat too suddenly applied to a frost-bitten limb, is one of the facts, on which he founds his opinion.

experiments offer little essential variation, though two of them were tried on a new subject.

The cold water had always salt mixed in it, in the proportion of one to twenty-four; and the cold was always lessened one or more degrees by the stay made in it.

The parties immersed were generally agitated, so that the pulse was quickened; but the cold bath sunk it twenty beats in the minute from its last rate; and at the wrist, it was scarcely to be felt. A sense of cold at the stomach was generally followed by a rapid fall of the thermometer; and heat applied there so generally restored the heat in other parts that the author is persuaded that the stomach or diaphragm, or both, have some concern in the process of animal heat.

The following facts also appeared. 1° The parties best resisted situations tending to produce cold, when they possessed most of their natural heat, as by wearing a flannel dress. 2° Cold wind operated more severely than colder calm weather. 3° Though the human body rapidly accommodates itself to change, yet the change may be made too quick, especially when the strength is diminished. 4° The action of cold water is more or less considerable, according to the vigour of the constitution. 5° The condition of the mind operates also; fear increasing the influence of cold; and attention pointed to other objects, as in madness, diminishing it. 6° These experiments require great caution, and the presence of every means necessary for counteracting their effects when carried too far.

The author, in an experiment upon himself, passed alternately but gradually out of a cold into a hot bath, twice; staying a short time only in each bath, and being covered with a flannel dress; but his internal heat never varied from 96.

By another experiment, it was found, that the cold of *fresh* water is more difficult to support, than that of salt water.

In another paper of the Appendix, we find *Dr. Wright* again coming into notice, through Dr. Duncan's Medical Annals for 1797. He was still, among other things, using, in the West Indies, external applications of cold in various shapes in the early stages of the ship fever and of the yellow fever, and with continued success; and in the

latter stages, he employed calomel in small doses, to procure purging and *sweating*. Where the stomach was too irritable for calomel, recourse was had to Capsicum (or Cayenne, commonly called Kian, pepper) made into pills; and it has cured even after the black vomit. This pepper has been given in the putrid sore throat, in the West Indies, with the most signal benefit.

In the course of this paper concerning Dr. Wright, Dr. Currie observes that perspiration seems useful in *every fever in every country*, not excepting the famous English sweating sickness; but that for this purpose it must be *profuse*, and also *early*, since in the latter stages of fever it is often injurious. The mode of exciting it, he says, may however be mechanical. Mr. Thomas Graham for example, covers the whole surface of the body for this purpose with warm vapour, in the early stages. In the plague, Count Berchtold relates, that perspiration may be produced by a pint of olive oil, rubbed during four minutes, upon the patient in a close room over hot coals, with a clean sponge; or if the first trial fails, then after wiping the body with a warm dry cloth, it may be repeated, and be aided by sudorific drinks. But in every case, the sweating must not only be early, but may be employed during the cold fit; when it will still leave room for the use of cold water in the hot fit, should the hot fit still occur.

Before quitting Dr. Currie, we shall give him pleasure, by affording him an opportunity to rectify two or three oversights.

First, Dr. Cullen does not, as he intimates, neglect *cold* as a cause of fever.

Next, Dr. Currie attributes the discovery concerning the near agreement of the heat of springs with the average heat of the place where they are found, to Dr. John Hunter; a British physician of eminence, (but not related to the celebrated surgeon and anatomist of that name.) Dr. Hunter's reputation does not need the aid of borrowed fame. The first observer of the fact appears to have been Dr. John Roebuck, F. R. S. at least Dr. William Heberden's comment upon the subject implies it. (See London Phil. Trans. for 1775.)

Lastly, Dr. Currie seems also to have omitted to notice Dr. Crawford's paper in the London Phil. Trans. for 1781; where that amiable philosopher stated, that the

difference between the colour of the venous and arterial blood increases with *cold* and lessens with *heat;* and that from the event connected with this difference, nature finds the means of proportioning the generation of heat to the call for it.* Dr. Currie knows that this difference of colour had its proper cause† assigned to it, by Dr. Priestley; which paved the way for Dr. Crawford's application of the fact, to explain the origin of animal heat as coming from the action of the air on the blood in the lungs. The above additional fact noticed by Dr. Crawford, if confirmed by a few more experiments, will probably go far to remove Dr. Currie's difficulties concerning this beautiful discovery respecting animal heat, which he extended also to combustion. Mr. Cavendish and the French chemists have by their new system led to some modification of this discovery, (for it is no longer to be called theory;) but however this shall be decided by time, the essence of the whole is Dr. Crawford's, and will render his name immortal. Dr. Rutherford, of Edinburgh, under their modification, explains the supply of water in diabetes to arise from "a portion of the oxygen, (which in the ordinary course of things is exhaled in the form of an elastic vapour,) being absorbed in the form of water." But Dr. Crawford's discovery requiring to be treated at length, we for the present drop any further discussion of it; especially as this hypothesis regarding diabetes, leaves its *symptoms* still unexplained.

In taking leave of Dr. Currie, let us do justice to his ingenuity, industry and candour. If his work stands the test of time, immortality also will be *his* lot. He is well known to many Americans frequenting Liverpool; but it

* Is there any decisive difference in the colour of the venous and arterial blood in insane persons indicative of their known power to resist cold; which the practitioner can pursue through all its mazes, so as to arrive at the means of assisting their malady? Their power of resisting cold has indeed its limits, since their limbs may be frost-bitten; and perhaps it seems greater than it is, from their attention (where they can command any) being directed to other objects; in which they agree also with children.

† Mr. Hewson and others had been aware that the air operated here, but they knew not *how* it operated. See London Phil. Trans. for 1776.

is not perhaps known to all Americans, that besides Middlesex, no county in England can boast of so many able and spirited medical men, as that of Lancaster; especially if we include Dr. Haygarth in the number, as united with them by intercourse, though residing in Chester. Among the foremost of these, we may certainly place the excellent Dr. Percival, of Manchester; to whose zeal for philosophy and for humanity, we may attribute in no small degree the honourable pre-eminence here mentioned.

As to our analysis, though it includes the chief substance of Dr. Currie's book containing 347 octavo pages, the reader will not fail to peruse that work, with pleasure; nor, having read that work, will the reader perhaps regret his having seen this analysis. Dr. Currie is not in every respect methodical; but he is more; he is original on some of the most important of medical subjects.

The foregoing abridgment was published in a pamphlet, during the melancholy devastation of our cities by the prevailing epidemic fever. The respected and benevolent author will not, it is presumed, require an apology for the republication of a work so honorary to himself, and so extensively useful to the community.

A BRIEF ANALYSIS.

OF THE SECOND VOLUME OF CURRIE'S MEDICAL REPORTS.

This volume is composed chiefly of additional evidence in favour of the opinions and practice proposed in the volume preceding. This evidence is furnished not only from Dr. Currie's own experience, but is communicated to him from practitioners in various situations, and from various climates.

The following is a comprehensive statement by Dr. Currie of his experience at the time of publishing this volume.

"In the six years, which have elapsed since the publication of the second edition of the first volume, I have invariably employed the affusion of water, cold and tepid, in the diseases pointed out in the original publication, and I have extended it to some others, of which I shall afterwards speak. Its success has equalled my expectations; I have nothing to detract from the accounts I have formerly given of its efficacy. I repeat, that used in the three first days of fever the cold affusion very generally stops the disease—that the same happy effects sometimes follow its use on the fourth or even fifth day, but seldom later; that even in the subsequent stages, where the heat continues preternaturally great, and the skin dry, it is of great and manifest advantage, almost immediately relieving the most distressing symptoms, particularly restlessness and delirium, and conducting the disease to a safe and speedier issue.

"The tepid affusion is, as I formerly observed, applicable, and possesses very considerable, though inferior efficacy. I find it, however, very safe, easy of application, and in a high degree grateful, and I have extended it to almost the whole class of febrile diseases. In my practice the cold and tepid affusions are very often combined in the same disease. While the heat is great, the skin dry, and the vascular action strong, I use water perfectly cold; when these symptoms diminish, I use it cool; and as they subside still farther, I make it tepid."

The precise meaning of these terms is given in Chapter X. Vol. I.

The limits of this analysis will permit us to state only such remarks as are most essential, and those in very general terms.

Dr. Currie describes an epidemic dysentery, which prevailed in Liverpool in 1801. In this disease, which was attended with fever, he did not try the application of cold in any form; for he had learnt by experience that that remedy was not successful in fever, attended with affections of the bowels. The tepid affusion he did try, but without any permanent benefit, although it abated the heat.

In Scarlatina of the same year he employed very extensively "the affusion, both cold and tepid, with the happiest effects." In this disease he followed the same rules, as in fever, without any regard to the eruption. Both Dr. Currie, and Dr. Gregory, professor of the practice of medicine in the university of Edinburgh, evidenced their confidence in the cold affusion by applying it to their own children, when affected with Scarlatina.

In this disease it is commonly necessary to repeat the affusion very often, and at very short intervals; in some instances ten or twelve times in twenty-four hours. Dr. Currie assisted this remedy by giving cold drinks, and by opening the bowels, if necessary, with sub-muriate of quicksilver; and in a few cases he also employed tartrite of antimony as a diaphoretic. He suggests doubts respecting cinchona in this disease; and strongly reprobates the use of wine, while there is any considerable heat on the surface.

In typhus, which also prevailed in Liverpool in 1801, our author did not find his favourite remedy so useful as on former occasions. The affusion, seldom lower than cool, generally tepid, was employed in most cases of the fever of that season. It was beneficial, but did not cut short the disease, even when employed at an early stage. But there was an unusual deficiency of heat, and therefore no opportunity was afforded of employing the cold affusion, which is much more efficacious than the tepid water. Dr. Currie suggests, in contradiction however to his own principles and cautions, that "a practice somewhat bolder might have been more successful."

Dr. Currie avers, that he has not seen nor heard of any instance, in which the practice of cold affusion has been

injurious. He doubts the utility of this practice in cases, where there is an unusual sensibility of the surface of the body to cold. Yet he gives a case, in which Mr. Dalrymple, of Norwich, disregarded this doubt not only with impunity, but with advantage.

In some cases of *cynanche tonsillaris*, or inflammatory sore throat, and likewise of measles, the cold affusion was employed in the early stages under a mistake respecting the nature of the cases. In these instances, there was no injury produced; and they were noticed as proving singularly mild.

Dr. C. did not employ the affusion of water on any person affected with influenza, except himself. While he had that disease he submitted to the shower bath at 85° every three or four hours. The effects seem to have been beneficial. But Dr. Wright informed him that he employed the cold affusion in this disease to "keep down heat and flushings," at the same time he allowed wine and a liberal diet; "a mode of treatment, which he found invariably successful."

The following statement is quoted, as it relates to cases of yellow fever, originating in our own country.

"Mr. Wilson, surgeon of his Majesty's ship the Hussar, employed the cold affusion with extraordinary success in 1795. The Hussar had taken a French ship from Gaudaloupe, off the Capes of Virginia, which had brought the yellow fever out of port with her, of which many had died. The disease spread rapidly among the crew of the Hussar, and the ship, running northwards, landed eighty-three persons ill of the fever, at Halifax, in Nova Scotia, in the month of June. There not being accommodation for them in the hospital, tents were fitted up for them on the shore, in which Mr. Wilson attended them. His practice was to bleed early, generally in an hour after the accession of the hot stage. He then gave a solution of emetic tartar. The cold affusion was always administered in cases of delirium, which it immediately removed, inducing tranquillity and sleep. *Of these eighty three cases, Mr. Wilson did not lose one.*"

Among many very important communications and testimonials in favour of the practice of cold affusion is an interesting letter from Mr. Nagle, surgeon to his Majesty's ship Ganges, to Dr. Currie; but its length forbids its insertion here, nor does the subject require a more ample illustration.

Although not precisely connected with the subject, we cannot omit to notice one very interesting case, in which an ounce of tincture of opium was swallowed by mistake. After vomiting, the other usual effects were following, but these were almost completely counteracted by the repeated affusion of water heated to 106° and 108°, over the naked body.

It does not belong to this place to decide either on the merit or on the precise extent of the utility of the practice recommended by Dr. Currie. We must, however, exhort every man who practises physic, to study the work, of which this is a very short analysis, and in adopting its principles to regard all the rules and cautions it inculcates.

The treatment of malignant or typhus fever by the affusion or ablution of cold water has been adopted since Dr. Currie's publication, by some of the most eminent physicians on both sides of the Atlantic. Dr. Thomas, author of modern practice, a work of superior merit, asserts as an indisputable fact, established upon the firmest basis, that affusing the body with cold water is one of the most powerful and efficacious means which we can employ in typhus fever. But its effects will be more salutary in proportion as it is adopted early, or during the first stage of the disease, and it ought always to be employed immediately after having evacuated the contents of the alimentary canal. He refers to an ingenious publication on the subject, by Dr. Jackson. (Exposition on the practice of applying cold in fevers.) Both these physicians having resided in the West Indies, experienced extensive opportunities of putting in practice this remedy in the malignant fevers of that climate, and they adduce the most substantial evidence of the success which attended the practice both in their own hands and in those of many other respectable practitioners.

Among other testimonials of successful results, the author mentions that Mr. Marshall, surgeon of the Cheshire regiment, employed it at an early period, in sixty-four cases, in sixty of which, the disease was happily arrested by having recourse to it three or four times, and in the other four which were advanced in their progress, although the disease was not prevented from going through its natural course, still all the patients recovered. Mr. Marshall mentions, that from the time he began the cold

affusion he used little or no wine, no opium, nor indeed scarcely any other remedy in any one case in which the cold affusion was employed; which report Dr. T. thinks, is of itself sufficient to establish its decisive superiority over every other mode of treatment. Dr. T. always takes the precaution of giving a glass of warm wine, or some other powerful cordial, immediately after employing the remedy. He relates numerous extraordinary recoveries under this mode of treatment, and says, that the same practice has also been adopted in the London House of Recovery, and apparently with the most decided success; and expresses a hope, that the prejudice against the remedy will soon subside, that the public may receive all the advantage which it is calculated to afford.

COLD AND WARM BATHING.

The observations here subjoined relative to the important subject of cold and warm bathing, selected from various respectable sources, will not be deemed superfluous.

Cold baths are those of a temperature varying from the thirty-third to the fifty-sixth degree of Fahrenheit's thermometer. The general effects, produced in a healthy person by immersion into an ordinary cold bath (that is, water of the temperature of forty-eight or fifty degrees) are, according to the accurate statement of Dr. Saunders, as follow: "First, there is a general sensation of cold, forming that sudden shock to the whole system, which is one of the most important effects of the cold bath. This is almost immediately succeeded by an equal universal sense of warmth, which increases rapidly to a certain point, so as to cause the surrounding water, though actually cold, to feel of a comfortable warmth; and this feeling is sooner produced, and continues longer, in proportion as the person is in full health, and naturally possesses a vigorous circulation. By degrees, however, if the body continues immersed, it becomes chilled; violent shivering comes on; the extremities grow numb and pale; sometimes sickness takes place; and, at last, the animal powers are exhausted by cold and fatigue. In this process, the most remarkable effects are those which occur first, and are directly consequent to the shock of immersion; and these require particular attention in a medical view, as it is only to the production of these that the cold bathing should be suffered to proceed.

"The sensations of returning warmth which take place directly after the cold of the first immersion, constitute what has been called the *re-action of the system;* and this is certainly a proper and characteristic term, as it imports an action produced in the body itself, to resist an external impression. Re-action in this place seems to be a peculiar effort of the living power, and to be excited in a degree proportionate to the force of that power, and

to the intensity of the cause which called it into action. It implies not merely an increase of the production of animal heat, but superadded to this, a sudden effort within the body, and the whole arterial system, to overcome an impression on the extremities as sudden and powerful. Hence it is, that a mere abstraction of heat, by a cold medium. will not produce that which is precisely meant by re-action, except the external cold be applied suddenly, and to a large surface. These two conditions are fulfilled by sudden immersion into cold water. The superior power of conducting heat, which water possesses over air, is also a circumstance that is always to be kept in mind in applying cold externally. This is particularly shewn where a person continues long in this cold medium beyond the first effects of re-action. On account of the high conducting power of water, the body must be constantly employed in producing an unusual quantity of heat; and this appears to be a great effort in the constitution, which, if carried too far, goes directly to destroy the animal powers." Thus three effects are produced by immersion in cold water; viz. an instantaneous and powerful shock, a sudden abstraction of heat from the surface of the body, and that exertion of the vital energies to counteract the shock and restore the lost quantity of animal heat, which is termed re-action. It is easy to perceive, that when the body is placed under such circumstances for a few seconds, a considerable impression must be made, first upon the sentient system, that is, the brain, and its ramifications, the nerves; and, secondly, upon the sanguiferous and absorbent systems: and that such impression may be rendered subservient to the prevention and cure of various diseases. It contributes in various ways to brace the human body. The relaxed fibres of the skin and the muscles acquire more solidity and compactness from contraction. Their elasticity is increased, and thus a considerable defect removed. The nerves are stimulated and excited to those powerful exertions, on which the vigour of the body so much depends. Hence the superior advantages of cold bathing over all internal *corroborants*, its immediate salutary action being on the solids, without the intervention of the organs of digestion and nutrition. It is peculiarly adapted to those constitutions which, though robust and apparently healthy, are liable to nervous, hysteric, hypocondriacal, and paralytic, affections, as well as to frequent attacks of flatulency, and consequent indigestion. As cold bathing is a remedy,

which is successfully employed for the cure of various disorders, so is it a preservative against others, and particularly against febrile infection. When used by persons in health, it increases the tone of the muscular fibre, strengthens the digestive organs, and by diminishing the sensibility of the whole system, and particularly of the skin, renders the body less susceptible of atmospheric impressions from cold, wet, and sudden changes of temperature; thus contributing to the production of what is termed a robust or athletic constitution. The duration of every cold bath applied to the whole body ought to be short; for its efficacy depends upon the sudden impression of the cold upon the skin and nerves. Much mischief is frequently done by staying in too long. It is a vulgar error, that it is safer to enter the water when the body is cool, and that persons heated by exercise and beginning to perspire, should wait till they are perfectly cooled. Thus plunging into it in this state they experience a sudden chilliness that is alarming and dangerous. In such cases, the injury is generally imputed to going into the water too warm, whereas in truth it arises from going in too cool. To use the cold bath without danger, and, on the contrary, with great advantage, is to dip into the water when the heat of the body has been a little increased by exercise. In this way only is the plunge productive of a shock, without which not the smallest benefit arises from cold bathing. Healthy persons may continue in it much longer than valetudinarians; and both will be influenced by the temperature of the air, so that in summer they can enjoy it for an hour, when in spring or autumn, one or two minutes may be sufficient. The head should first come in contact with the water, either by immersion, pouring water upon it, or by the application of a wet cloth, and then diving head foremost into the water. The immersion ought to be sudden, that the first impression may be uniform all over the body; a contrary method would be dangerous; as it might propel the blood from the lower to the upper parts of the body, and thus occasion a fit of apoplexy. The best place for cold bathing is in the invigorating water of the sea, or a clear river. The morning or forenoon is the most proper time, either when the stomach is empty, or two hours after a light breakfast. While in water the person ought to move about, in order to promote the circulation of the blood from the inner parts of the body to the extremities. After immersion the whole body ought to rubbed dry as

quick as possible, with a dry and somewhat rough cloth. Moderate exercise out of doors if convenient is advisable, and indeed necessary after bathing. If after going into the cold bath a glowing warmth pervade the whole body, we are assured of its salutary effects, but if the patient feel dull or chilly, or complain of headach or tightness across the chest, it is a proof that it disagrees, and it should accordingly be discontinued. A temperate bath (i. e. from 70° to 85° or more) is applicable to the same cases as the cold bath, and may be used in the same manner. It is preferable in many cases where the shock of the ordinary cold bath is too great. It should be remarked, that this powerful remedy is not suited to those, who have a tendency to consumption, nor to such as are constitutionally liable to bowel complaints. It should also be prohibited in cases of general plethora, or full habit of body; in hæmorrhages, and in every kind of inflammation; in constipations, in diseases of the breast, difficult breathing, short and dry coughs, &c.; in an acrimonious or sharp state of the fluids, bad colour of the face, difficult healing of the flesh, and the scurvy, properly so called; in fits of the gout; in cutaneous diseases, and in a state of pregnancy.

Where persons cannot resort to the sea or a river the most eligible method is by the *shower bath*, a proper apparatus for which is to be had at the tin shops; or water may be poured from a common water pot over the head and shoulders, while the person sits upon a stool, placed in a large tub; by this method considerable benefit is derived from the gravity as well as the tonic power of the water. The head and breast are secured from danger by receiving the first shock, and the water is quickly transmitted over the whole body. The temperature of the water too may be more easily modified and adapted to the circumstances of the patient. For these and other reasons the *shower bath* possesses advantages superior to all others.

The cold bath is highly useful to preserve children from the bowel complaints, which prevail in the summer throughout the United States, and in cases of rickets it is eminently beneficial.

The warm or *tepid bath* is about the same temperature with the blood, between ninety-six and ninety-eight degrees of Fahrenheit's thermometer. *Warm bathing* is a remedy not less efficacious than the former in diseases of an opposite nature; but concerning the operation o

which, wrong notions have till very lately been entertained by the generality of medical writers and medical practitioners. It has been imagined that the warm bath relaxes and weakens, whereas it produces a contrary effect; unless indeed the temperature be so high, or the time of immersion continued so long, as to bring on that degree of debility, which is accompanied with deliquium. But this arises only from an abuse of hot bathing, and is even then the consequence of an excess of stimulation. So far is immersion of the body in water, heated to ninety-six, from having a lowering or weakening operation, that when duly regulated, it is found to raise the spirits, to mend the pulse and appetite, and to refresh and invigorate the whole frame. Hence the benefit derived from it after great fatigue; in old age; in atonic gout, accompanied with stiffness and pallid swellings of the joints; in paralysis; in chlorosis; in diseases arising from a certain torpor of the lymphatic and glandular system; such as scrofula, leprous, and other chronic eruptions, &c. In cases of predisposition to phthisis, it abates the frequency of the pulse, and tends to retard at least, if it does not wholly prevent, the pulmonary affection. In consequence of its soothing and agreeable impression upon the surface of the body, it produces very beneficial effects in certain disordered states of the alimentary canal, originating in diminished action; and it affords the best and speediest relief in a great variety of painful disorders, whether connected with local inflammation or not; such as chronic rheumatism, certain forms of lues venerea, nephritis, calculus vesicæ, colic, enteritis, &c. Dr. Charleton, of Bath, in England, asserts that, of nine hundred and ninety-six paralytics, most of whom had resisted the powers of medicine, eight hundred and thirteen were benefited by the proper application of the warm bath. The time of immersion should be varied according to the temperature of the water, and the feelings of the patient. In a bath of ninety-six, a person may remain fifteen, twenty, or thirty minutes, or even longer; but in one of ninety-eight or one hundred, it will seldom be proper, and indeed there are few persons that can bear to remain beyond ten minutes, and in the generality of cases not so long. Patients labouring under chronic rheumatism and palsy, bear the high degree of temperature best. When sweating is desired the warm bath should be used in an evening, and the patient should immediately afterwards be put into a warm

bed, and remain there until late the next morning: but in all other cases, the best time for using the warm bath will be in the forenoon, about two hours after breakfast. In these cases the bathers should not retire to bed, nor confine themselves within doors, but go about as usual; unless the weather should be particularly damp or inclement. Hot bathing, like cold bathing, is applied topically by pumping on the diseased part. Sometimes steam is applied to the body instead of warm water. The warm bath is of very great utility to such individuals as are troubled with a parched and rough skin; in this and in most other cases a free use of friction with a flannel cloth, while in the water, will prove extremely beneficial.

The celebrated count Rumford has paid particular attention to the subject of warm bathing; he has examined it by the test of experiments long and frequently repeated, and bears testimony to its excellent effects. "It is not merely on account of the advantages," says the count, "which I happened to receive from warm bathing, which renders me so much an advocate for the practice. Exclusive of the wholesomeness of the warm bath, the luxury of bathing is so great, and the tranquil state of mind and body, which follows, is so exquisitely delightful, that I think it quite impossible to recommend it too strongly, if we consider it merely as a rational and elegant refinement." "The manner, in which the warm bath operates," continues the count, "in producing its salutary consequences, seems very evident. The genial warmth, which is applied to the skin, in the place of the cold air of the atmosphere, by which we are commonly surrounded, expands all those very small vessels, where the extremities of the arteries and veins unite, and by gently stimulating the whole frame, produces a free and full circulation, which, if continued for a certain time, removes all obstructions in the vascular system, and puts all the organs into that state of regular, free, and full motion, which is essential to health, and also to that delightful repose, accompanied by a consciousness of the power of exertion, which constitutes the highest animal enjoyment of which we are capable. If this statement be correct, it cannot be difficult to explain, in a manner perfectly satisfactory, why a warm bath is often found to produce effects when first used, and especially by those, who stay in the bath for too short a time, which are very different from those which it ought to produce, and which it cannot fail to produce when properly managed. We

shall likewise be enabled to account for the feverish symptoms, which sometimes result from going out of a warm bath into a warm bed. The beginning of that strong circulation, which is occasioned on first going into a warm bath, is an effort of nature to remove obstructions; and, if time be not given her to complete her work, if she be checked in the midst of it, the consequences must necessarily be very different from those which would result from a more scientific and prudent management. Hence we see how necessary it is to remain in a warm bath a sufficient time, and above all how essential it is that the bath should be *really warm*, and *tepid*, or what has been called temperate." *Ree's Cyclop.*

"Dr. Marchard, resident physician of Pyrmont, has, in our opinion," says Dr. Willich, (Dom. Ency.) "satisfactorily demonstrated, that the warm bath, in many cases of debility, from spasms, pain, anxiety, and other causes, as well as to hectic and emaciated persons, is, *generally*, of eminent service, and almost the only means of restoring their health, and prolonging their lives. Instead of *heating* the human body, as has erroneously been asserted, the warm bath has a cooling effect, in as much as it obviously abates the quickness of the pulse, and reduces the pulsations in a remarkable degree, according to the length of time the patient continues in the water. After the body has been over-heated by fatigue from travelling, violent exercise, or from whatever cause, and likewise after great exertion or perturbation of mind, a tepid bath is excellently calculated to invigorate the whole system, while it allays those tempestuous and irregular motions, which otherwise prey upon, and at length reduce, the constitution to a sick-bed." Upon the whole, it were much to be wished that the use of the warm baths were more general among all classes of people. "Considered as a species of universal domestic remedy, as one which forms the basis of cleanliness, bathing in its different forms may be pronounced one of the most extensive, and beneficial restorers of health and vigour.

N. B. Those who are desirous of improving a fund of instruction and amusement, relative to this interesting subject, are refered to Dr. Saunders's "Treatise on Mineral Waters," "A view of the Russian Empire, &c. by the Rev. Mr. Tooke. But more especially, a truly animated and brilliant account of the use of the warm bath, to be found in M. Savery's "Letters on Egypt."

No. VII.

ON THE CULTIVATION

OF THE

PAPAVER SOMNIFERUM, OR POPPY PLANT.

AND THE METHOD OF PREPARING OPIUM.

Such is the intrinsic value of opium, and such the high price which it commands, that every method, promising to increase the quantity in the market, should be encouraged as of great importance to the community.

The citizens of the United States have not in general been apprized, that this exotic may be cultivated on our own soil to an extent adequate to every exigency, and with a profit exceeding that of many other productions of husbandry.

Opium is the inspissated juice of the papaver somniferum, or white poppy, and also of the common garden poppies of every description. From the testimony of travellers, we learn that in the several provinces of Asia, the white poppy plant attains in one season the height of from thirty to forty feet, bearing capsules weighing ten or twelve ounces, from which opium is obtained in immense quantity, by tapping them at the proper season. In England the climate and soil are not favourable to such luxuriant production, but according to the experiments of Mr. John Ball, fields cannot be sown with any thing more lucrative to the farmer, especially if those fields have a south exposure. The society for the encouragement of the arts, &c. for the year 1796, granted a premium of fifty guineas to Mr. Ball, and also a similar reward to Mr. Jones, for their exertions, and a discovery of their method of preparing opium from poppies reared in England, which proved in all respects equal in effect and superior in purity to the best foreign opium. By a

calculation, says he, which I have made, suppose one poppy to grow in one square foot of earth, and to produce only one grain of opium, more than fifty pounds will be collected from one statute acre of land. But he asserts that one poppy having twenty-eight heads, produced above thirty grains of opium. The particular species which Mr. Ball prefers as most productive, is the *double* or *semi-double*, each root of which produces from four to ten heads or pods, containing large dark coloured or variegated flowers.* The seeds of the poppy in their unripe state are very nourishing, are divested of the narcotic property of the juice, and yield on expression a mild sweet oil little inferior to that of almonds: hence they are often employed as an article of diet, and it is customary in the east to carry a plate of them to the table after dinner with other fruit.

The attempts to cultivate this valuable plant in the United States, have been abundantly successful, and established the important facts, that every species and variety of the plant is equally capable of producing good opium; and that the collection of it might not only become a useful, but also a lucrative employment. Dr. Shadrach Ricketson, of Dutchess county, New York, and Dr. Reynolds, of Montgomery county, Maryland, have favoured the public with their mode of cultivation, and the result of their experiments.

The poppy seeds in this country, should be sown or planted about the middle of May, or as early in that month as the warmth of the season will admit: the soil should be moist, good, and well manured. The seeds should be planted at about ten or twelve inches distance in transverse rows, which should also be about the same distance from each other. They may be planted much thicker than is intended to allow the plants to grow, one plant in every square foot being as much as will grow advantageously. The residue should be pulled out at the first or second hoeing. The hoe must be frequently and carefully employed to keep the plants from being shaded by weeds; and when grown about four inches high, if the land be dry and not fertile, they may be frequently watered and manured. About the middle of July, the plants, in their flowering state, arrive at maturity, and yield the most juice; when commences the tapping or harvest.

* See Annals of Medicine, 1796.

The tapping ought to be commenced directly after the flower leaves begin to wither or fall from the capsules, and during a sun-shining day. If this be neglected many days, the stalk becomes dry, and no juice can be obtained. The Asiatic method of performing this operation, and which Mr. Ball adopted, is, to make several longitudinal incisions, without penetrating their cavities, first on one, and afterwards on the opposite side of the capsules, leaving the exuding juice to dry till the succeeding day, when it is to be scraped off. But it is well ascertained, that the more eligible method is, first to cut off with a sharp knife the stalk about half an inch below the capsule; then holding the capsule in one hand, take the milky juice that issues from it with a knife, and put it upon an earthen plate; by this time the top of the incised stalk will hold another large drop, which should be removed as before; this done, the stalk should be cut about an inch lower, when a similar drop of juice will issue: the cutting must be repeated as often as the milk rises upon the top. This juice must be exposed to the sun in earthen vessels, frequently stirring it, when in a few hours the aqueous part will evaporate, and the genuine opium be formed, much stronger and more pure than any imported.

Dr. Ricketson has found by experience, that although every species of variety of the plant affords the same opium, yet a single species, and of the variety of large red or purple flowers, is deserving the preference, as growing more luxuriantly than any other, and producing from two to four stalks or heads from one seed. The capsules or heads grow particularly large, as do also the stalks; and it is obvious, that in these particulars, the superiority of this variety of the plant consists. The quantity of opium that may be procured, says Dr. Ricketson, depends very much upon the largeness of the plant, and the care used in collecting it. From one poppy plant he produced seven grains of the inspissated juice.

Two species of the poppy plant were exposed to the experimental observation of the compiler of this volume the last season: the single species bearing a variegated reddish or purple flower, consisting of four leaves only, and the double or many-leaved poppy producing smaller capsules, and a flower of a pale reddish colour. The former of which proved to be incomparably the most succulent and productive. It attains to the height of

from four to five feet, branching out numerous side-stalks; and more than fifty heads were counted upon one plant proceeding from a single seed. It continues to send forth capsules and flowers in succession from about the middle of July to the middle of September. Attention therefore must be paid to collecting the juice during several weeks. The method of cutting the stalk half an inch below the capsule, and repeating it as often as the juice rises upon the top, is decidedly the most eligible that can be adopted.*

From twenty plants the spontaneous and promiscuous growth from seeds lodged in the garden during several preceding years, one hundred and ten grains of pure and strong opium were obtained. By a subsequent experiment, I have ascertained that an average number of one hundred plants will yield one ounce of pure opium. To this product however is to be added a quantity of extract which may be procured by boiling the capsules and stalks of the poppy in water after extracting the milky juice, which if properly prepared will possess about half the power of genuine opium. The capsules recently cut, and the stalks separated from the root, are to be boiled in a large quantity of water about four hours, when the liquor should be strained off, and afterwards reduced by evaporation over a moderate fire to the consistence of extract; care should be taken at the latter part of the process to stir it frequently to prevent its being injured by burning. The seeds contained in the capsules will yield a quantity of bland oil, which being destitute of any narcotic property, should be skimmed off while floating on the surface of the liquor, lest it be incorporated with the extract and thereby injure its strength. It is to be observed that the trouble and inconvenience in collecting the juice of the poppy is by no means inconsiderable, but when it is considered that this operation, by far the greatest part of the whole labor of the season, may be performed by women and children, and that the crop would be ready for the market and exchanged for cash in the short space of four or five months, it will be conceded, that when the price of opium exceeds ten dollars per pound; the cultivator of the poppy may anticipate a profit greatly exceeding that of the ordinary crops of Indian corn or other grain.

* Some of the largest heads should be reserved to mature seed for the ensuing season. We are assured that Linnæus counted in one poppy-head thirty-two thousand seeds.

It is a subject of grateful reflection that in every exigency we may resort to that all bountiful source of national and individual wealth, our native soil, which with the labour of our hands, may administer to our necessities, and supersede the importation of expensive and frequently adulterated foreign productions. To the the cultivators of rice in our southern states enjoying a climate and soil, supposed to be peculiarly adapted to the growth of the poppy, it must be a very interesting inquiry, whether the culture of this plant might not be an excellent substitute for that of rice. A rich and moist soil is most congenial to the poppy, and even if the planter should not in the first instance realize an equivalent remuneration, yet the draining off stagnant water from noxious rice swamps, will annihilate one of the most fertile sources of pestilence and disease, and thereby essentially meliorate their own local condition. From experiments on a small scale, the probable issue of more extensive attempts might be predicted. Every effort, therefore, to effect an object so truly interesting and important ought to be duly encouraged and rewarded.

Edinburgh.	*Dublin.*
Acidum Acetosum	Acetum vini
destillatum	distillatum
forte	Acidum Aceticum
camphoratum	camphoratum
syrupus	
Acetum aromaticum	
Acidum benzoicum	Acidum benzoicum
Acidum citricum	Acidum citricum crystallis concre-
Acidum muriaticum	Acidum muriaticum [tum
dilutum	
Acidum oxy-muriaticum	Aqua oxy-muriatica
Acidum nitricum	
nitrosum	Acidum nitrosum
dilutum	dilutum
unguentum	unguentum
Acidum succinicum	Acidum succinicum
Acidum sulphuricum	Acidum sulphuricum
dilutum	dilutum
aromaticum	
Acipenser huso, &c.	Ichthyocolla
Aconitum Napellus	Aconitum
succus spissatus	
Acorus calamus	Acorus
Æsculus Hippocastanum	Æsculus Hippocastanum
Agrimonia Eupatoria	Agrimonia
Æther nitrosus	Æther nitrosus
Ætheris nitrosi, spiritus	Spiritus æthereus nitrosus
Æther sulphuricus	Æther sulphuricus
cum alcohole	Liquor æthereus sulphuricus
aromaticus	Liquor æthereus oleosus
Alcohol	Alcohol
Alcohol	Spiritus vinosus rectificatus
dilutum	Spiritus vinosus tenuior
ammoniatum	Spiritus ammoniæ
aromaticum	aromaticus
fœtidum	fœtidus
Allium cepa	Cepa
Allium sativum	Allium
	syrupus
Allium porrum	
Aloe socotorina	Aloe socotorina
hepatica	hepatica

London.	*Various.*
Acetum	
Acidum aceticum	
	Acetum radicale
	Acetum prophylacticum
Acidum benzoicum	Flores benzoini, *or* Benzoes
Acidum citricum	Acidum limonum
Acidum muriaticum	Spiritus salis Glauberi seu fumans
	Spiritus salis communis acidus
Acidum nitricum	
	Spiritus nitri Glauberi seu fumans
Acidum nitricum dilutum	Aqua fortis
Acidum sulphuricum	Oleum vitrioli
Acidum sulphuricum dilutum	Spiritus vitrioli acidus
	Elixir vitrioli aromaticum
	Colla piscium
Aconitum	Aconitum Neomontanum
Extractum aconiti	
Calamus	Acorus verus
	Hippocastanum
	Naphtha nitri
Spiritus ætheris nitrici	Spiritus nitri dulcis
Æther sulphuricus	Naptha vitrioli
Æther rectificatus	
Spiritus ætheris sulphurici	Spiritus vitrioli dulcis
Oleum æthereum	Oleum vini
Spiritus ætheris compositus	Liquor anodynus Hoffmanni
Spiritus ætheris aromaticus	Elixir vitrioli dulce
Alcohol	Spiritus vini rectificatissimus
Spiritus rectificatus	
Spiritus tenuior	
Spiritus ammoniæ	Spiritus salis ammoniaci dulcis
aromaticus	Spiritus volatilis oleosus
fœtidus	Spiritus volatilis fœtidus
succinatus	Eau de luce
Allium	
Porrum	
Aloes spicatæ extractum	Aloe spicata, *Dub.*
Aloes vulgaris extractum	Aloe sinuata, *Dub.*

Edinburgh.	*Dublin.*
Aloe pilulæ	Aloe cum zingibere pilulæ
et assæ fœtidæ pilulæ	
cum colocynthide pilulæ	Colocynthidis pilulæ compositæ
et myrrhæ pilulæ	Aloes cum myrrha pilulæ
	cum canella pulvis
	cum guaiaco pulvis
tinctura	tinctura
ætherea	
et myrrhæ tinctura	tinctura composita
vinum	vinum
Althæa officinalis	
syrupus	
decoction	
Aluminæ sulphas	Alumen, super-sulphas argillæ alcalisatæ
exsiccatus	ustum
pulvis compositus	
Amomum repens	Cardamomum minus
tinctura	tinctura composita
zingiber	Zingiber
	tinctura
syrupus	syrupus
Amomum zedoaria	Zedoaria
Ammoniacum	Amoniacum
	lac
	cum hydrargyro emplastrum
Ammoniæ aqua	Aqua ammoniæ causticæ
carbonas	Carbonas ammoniæ
carbonatis aqua	Aqua carbonatis ammoniæ. Liquor volatilis cornu cervi
acetitis aqua	Aqua acetatis ammoniæ
murias	Sal ammoniacum; Murias ammoniæ
	Aqua sulphureti ammoniæ
hydro-sulphuretum	Hydro-sulphuretum ammoniæ
Amygdalus communis; nucleus	Amygdalæ dulces
oleum	Oleum amygdalarum
emulsio	Amygdalæ lac
Amyris Gileadensis; resina liquida	

London.	*Various.*
Decoctum aloes compositum	
Extractum aloes	
Pilulæ aloes compositæ	
	Pilulæ cocciæ
	Pilulæ Rufi
Pilulæ aloes cum myrrha	Hiera picra
	Pilulæ aromaticæ
Pulvis aloes compositus	ecophraticæ
Tinctura aloes	Essentia aloes
	Elixir proprietatis vitriolicum
Tinctura aloes composita	Elixir proprietatis
Vinum aloes	Tinctura saera
Althæa	Bismalva.
Syrupus althææ	
Alumen, supersulphas aluminæ et potassæ	
Alumen exsiccatum	
	Pulvis stypticus
Liquor aluminis compositus	Aqua amminosa Bateana
	Coagulum aluminosum
Cardamomum	Amomum cardamomum. *Dub.* Elettari cardamomum. *Lond.*
Tinctura cardamomi composita	Tinctura stomachica
Zingiber	Zingiber officinale. *Lond.*
Tinctura zingiberis	
Syrupus zingiberis	
	Heracleum gummiferum. *Lond.*
Mistura ammoniaci	
Emplastrum ammoniaci cum hydrargyro	Emp. ex ammoniaco cum mercurio
Liquor ammoniæ	Spiritus salis ammoniaci cum calce
Ammoniæ carbonas	Sal volatilis salis ammoniaci
Liquor ammoniæ carbonatis	Spiritus salis ammoniaci
	Spiritus cornu cervi
Liquor ammoniæ acetatis	Spiritus Mindereri
Ammoniæ murias	Ammonia muriata
Amygdala amara, dulcis	
Oleum amygdalæ	
Confectio amygdalæ	
Mistura amygdalæ	Emulsio communis
	Balsamum Gileadense

Edinburgh.	*Dublin.*
Amyris elemifera; resina	Elemi
	unguentum
Anchusa tinctoria	Anchusa
Anethum fœniculum	Fœniculum dulce
	oleum essentiale
	aqua
Anethum graveolens	
Angelica archangelica	
Angustura	Augustura
	tinctura
Anthemis nobilis	Chamæmelum
extractum	extractum
decoctum	dococtum compositum
	Enema catharticum
Anthemis pyrethrum	Pyrethrum
Antimonii sulphuretum	Sulphuretum antimonii
Antimonii sulphuretum præparatum	Sulphuretum antimonii præparatum
præcipitatum	Sulphur antimoniatum fuscum
oxidum cum sulph. vitrif.	
vitrificatum cum cera	
per nitrat. potassæ	
cum phosphate calcis	Pulvis antimonialis
murias	
	Oxydum antimonii nitro-muriati-
tartris	Tartarum antimoniatum [cum
vinum	
Apium petroselinum	
Aqua destillata	Aqua distillata
Arbutus uva ursi	Uva ursi
Arctium lappa	Bardana
Argentum	Argentum
nitras	Nitras argenti
Aristolochia serpentaria	Serpentaria virginiana
tinctura	tinctura
Arnica montana	Arnica
Aromaticum electuarium	Electuarium aromaticum
Aromaticus pulvis	Pulvis aromaticus
Arsenici oxidum	Arsenici oxydum album

London.	*Various.*
Elemi	
Unguentum elemi compositum	Balsamus Arcæi
Fœniculum	
Aqua fœniculi	
Anethum	
Aqua anethi	Aqua seminum anethi
	Angelica sativa
Cusparia	Bonplandia. *Willd.* Cusparia febrifuga. *Lond.*
Infusum cuspariæ	
Anthemis	
Extractum anthemidis	
Oleum anthemidis	
Infusum anthemidis	
Decoctum malvæ compositum	Decoctum commune pro clystere
Pyrethrum	
Antimonii sulphuretum	Stibium
Antim. sulphuretum præcipitatum	Sulphur aurat. antim. Kermes minerale
	Vitrum antimonii
	Vitrum antimonii ceratum
	Crocus metallorum
Pulvis antimonialis	Pulvis Jacobi
	Butyrum ant. Causticum ant.
Antimonii oxydum	Pulvis Algarothi
Antimonium tartarizatum	Tartarus emeticus
Liquor antimonii tartarizati	Vinum antimoniale
Aqua distillata	
	Lappa major
Argentum	
Argenti nitras	Causticum lunare
Serpentaria	
Tinctura serpentariæ	
	Doronicum Germanicum
Confectio aromatica	Confectio cardiaca
Pulvis cinnamomi compositus	Species aromaticæ
Arsenici oxydum præparatum	Arsenicum album

Edinburgh.	*Dublin.*
	Arsenias kali
Artemisia abrotanum	Abrotanum
Artemisia Absinthium	Absinthium vulgare
	extractum
Artemisia maritima	maritimum
Artemisia santonica	Santonicum
Arum maculatum	Arum
Asarum Europæum	Asarum
——— pulvis compositus	pulvis compositus
Astragalus tragacantha, gummi	Tragacantha
mucilago	mucilago
Atropa belladonna	Belladonna
succus spissatus	
Avena sativa	
Barytæ carbonas	
murias	
solutio	
sulphas	
Bitumen petroleum	Petroleum Barbadense
Boletus igniarias	
Bubon galbanum	Galbanum
	tinctura
Emplastrum gummosum	emplastrum
Calx	Calx recens usta
Calcis aqua	Aqua calcis
linimentum	Linimentum calcis
carbonas *a* creta alba	Creta, carbonas calcis
b marmos album	
præparatus	præparata
	præcipitata
potio	mistura
trochisci	
pulvis compositus	
muriatis solutio	Aqua muriatis calcis
Cancer pagurus	Cancer
Canella alba	Canella alba
Capiscum annuum	Capsicum
Carbo ligni	Carbo ligni
Cardamine pratensis	Cardamine
Carum carui	Caruon
spiritus	spiritus

London.	*Various.*
Liquor arsenicalis	Solutio mineralis Fowleri
Absinthium	
	Semen cinæ, seu contra
	Aron
Asarum	
	Pulvis sternutatorius
Tragacantha	Astragalus verus. *Lond.*
Pulvis tragacanthæ compositus	
Belladonna	Solanum lethale
Extractum belladonnæ	
Avena	
	Barytes. Terra ponderosa
	Terra pond. vitriol. Spathum pond.
Petroleum	Oleum petræ
	Agaricus chirurgorum
Galbanum	
Pilulæ galbani compositæ	Pilulæ gummosæ
Emplastrum Galbani compositum	Emplastrum commune cum gummi
Calx	Calx viva
Liquor calcis	Aqua calcis simplex. Solutio calcis
	Oleum lini cum calce.
Creta	
Lapis calcareus	
Creta præparata	
Mistura cretæ	Julepum e creta, Potio cretacea
	Tabellæ cardialgicæ
Pulvis cretæ compositus cum opio	Pulvis e bolo comp. Pulv. cretaceus cum opio
Canella alba	Costus corticosus
Capsicum	
Tinctura capsici	
Carbo ligni	
Cardamine	
Carui	Carvi
Spiritus carui	Aqua carvi spirituosa

Edinburgh.	*Dublin.*
	Caruon oleum essentiale
Caryophyllus aromaticus	Caryophyllus aromatica
Cassia fistula	Cassia fistularis
electuarium	electuarium
senna	Senna
tinctura composita	tinctura
electuarium	electuarium
extractum	
	syrupus
	infusum
Castor fiber; castoreum	Castoreum rossicum
tinctura	tinctura
composita	
	Castoreum canadense
	tinctura
Centaurea benedicta	Carduus benedictus
Cera alba	Cera alba
Linimentum simplex	
Unguentum simplex	unguentum
Cera flava	flava
	purificata
	unguentum
Cervus elaphus, cornu	Cornu cervinum
	Cornu cervini decoctum
	pulvis
	liquor volatilis
	oleum
	rectificatum
Chironia centaurium	Centaureum minus
Cinara scolymus	
Cinchona caribæa	
Cinchona officinalis	Cinchona; Cortex peruvianus
a communis	
b flavus	
c ruber	
extractum	extractum
	rubræ extractum resinosum
decoctum	decoctum
infusum	infusum sine calore
tinctura	tinctura

London.	*Various.*
Oleum carui	
Aqua carui	
Caryophylli	Eugenia caryophyllata. *Dub.Lond.*
Caryophylli oleum	
Infusum caryophyllorum	
Cassiæ pulpa	Diacassia
Confectio cassiæ	
Senna	
Tinctura sennæ	Elixir salutis
Confectio sennæ	Electuarium lenitivum
Syrupus sennæ	
Infusum sennæ	Infusum senæ commune
Pulvis sennæ compositus	
Castoreum	
Tinctura castorei	
Cera alba	Apis mellifica. *Dub.*
	Unguentum album
Cera flava	
Ceratum	
Emplastrum ceræ	Emplastrum attrahens
Cornua	
Cornu ustum	
Mistura cornu usti	Decoctum album
Pulvis cornu usti cum opio	
	Spiritus cornu cervi
	Oleum cornu cervi fœtidum
	e cornubus
	Cinara hortensis
Cinchona	
Cinchona lancifolia	
cordifolia	
oblongifolia	
Extractum cinchonæ	
cinchonæ resinosum	
Decoctum cinchonæ	Decoctum corticis Peruviani
Infusum cinchona	
Tinctura cinchonæ	Tinctura corticis Peruviani

Edinburgh.	*Dublin.*
	Cinchona tinctura composita
Citrus aurantium	Aurantium Hispalense
aqua distillata	
conserva	conserva
	tinctura
syrupus	syrupus
Citrus medica, fructus	Limon
aqua distillata	
syrupus	syrupus
Coccus cacti	Coccinella
Cochlearia armoracia	Raphanus rusticanus
	spiritus compositus
Cochlearia officinalis	Cochlearia
succus compositus	
Cocos butyracea, oleum fixum	
Colchicum autumnale	Colchicum
	oxymel
syrupus	
Colomba	Colombo
tinctura	tinctura
Conium maculatum	Cicuta
succus spissatus	succus spissatus
Convolvulus scammonia	Scammonium
pulvis compositus	
	electuarium
Convolvulus jalapa	Jalapa
Convolvuli jalapæ extractum	Jalapæ extractum
	resinosum
tinctura	tinctura
pulvis compositus	
Copaifera officinalis, resina liquida	Balsamum copaibæ
Coriandrum sativum	Coriandrum
Crocus sativus	Crocus
tinctura	tinctura
Croton eleutheria	Cascarilla
	tinctura
	extractum resinosum
Cucumis colocynthis	Colocynthis

London.	*Various.*
Tinctura cinchonæ composita	Elixir antihypochondriacum
Aurantium	Mala aurantia
Infusum aurantii compositum	
Confectio aurantii	Conserva flavedinis cort. aur.
Tinctura aurantii	Tinctura corticis aurantii
Syrupus aurantii	Syrupus e corticibus aurantiorum
Limones	
Syrupus limonis	Syrupus e succo citriorum
Coccus	
Armoracia	
Spiritus armoraciæ compositus	Aqua raphani composita
Infusum armoraciæ compositum	
	Succi ad scorbuticos
	Oleum palmæ
Colchicum	
Acetum colchici	
Calumba	
Infusum calumbæ	
Tinctura calumbæ	
Conium	
Extractum conii	
Scammoneæ gummi resina	Diagrydium
Pulvis scammoneæ comp.	Pulvis comitis Warwicensis
Confectio scammonii	Electarium caryocostinum
Jalapa	Mechoacanna nigra
Extractum jalapæ	Extractum jalapii
Tinctura jalapæ	Tinctura jalapii
Copaiba	Balsamum Brasiliense
Coriandrum	
Croci stigmata	Crocus Anglicus
Syrupus croci	
Cascarilla	Croton cascarilla. *Dub. Lond.* Clutia eleutheria. *Linn.*
Tinctura cascarillæ	
Infusum cascarillæ	
Colocynthidis pulpa	
Extractum colocynthidis	

Edinburgh.	*Dublin.*
	Colocynthis extractum compositum
Cuminum cyminum	
Cuprum	Cuprum
subacetis	Ærugo, subacetas cupri
	præparata
	oxymel
unguentum	unguentum
ammoniaretum	Cuprum ammoniatum
pilulæ	
	aqua
sulphas	Sulphas cupri
solutio composita	
Daphne mezereum	Mezereon
Daphnes mezerei decoctum	
Datura stramonium	Stramonium
Daucus carota	Daucus sylvestris
Delphinium staphisagria	Staphisagria
Dianthus caryophyllus	Caryophyllum rubrum
syrupus	syrupus
Digitalis purpurea	Digitalis
	decoctum
tinctura	tinctura
infusum	
Dolichos pruriens	Dolichos
Dorstenia contrajerva	
Eryngium maritimum	Eryngium
Euphorbii officinalis gummi resina	
Ferrum	Ferrum
limatura purificata	
carbonas præparatus	Rubigo ferri
præcipitatus	Carbonas ferri
oxidum nigrum purificatum	Oxydum ferri nigrum
sulphas	Sulphas ferri
exsiccatus	exsiccatum
oxidum rubrum	Oxydum ferri rubrum
emplastrum	Emplastrum thuris
muriatis tinctura	Tinctura muriatis ferri
	cum oxydo rubro
et ammoniæ murias	Murias ammoniæ et ferri
	Tartarum ferri
	Vinum ferri

London.	*Various.*
Extractum colocynthidis comp.	Extractum catharticum. Pil. rudii
Cuminum	
Emplastrum cumini	Emplastrum e cymino
Ærugo	Viride æris
Linimentum æruginis	Mel Ægyptiacum
Cuprum ammoniatum	Cuprum ammoniacum
Liquor cupri ammoniati	Aqua sapphirina
Cupri sulphas	Cuprum vitriol. Vitr. cœruleum
	Aqua styptica
Mezereum	Laureola; cocognidium
Daucus	Carota
Staphisagria	
	Caryophylla rubra
Digitalis	
Tinctura digitalis	
Dolichos	
Contrajerva	
Pulvis contrajervæ comp.	Lapis contrayervæ
Euphorbium	
	Chalybs
	Ferrum alcoholisatum
	Chalybis rubigo præparata
Ferri carbonas	
Mistura ferri composita	Mistura myrrhæ Griffiths
Pilulæ ferri cum myrrha	
	Squamæ ferri purificatæ
Ferri sulphas	Sal martis, vitr. viride. Sal chalybis
	Vitriolum calcinatum
	Colcothar vitrioli
	Emplastrum roborans
Tinctura ferri muriatis	Tinctura martis in spiritu salis
	Tinctuara martis aurea.
Ferrum ammoniatum	Flores martiales
Tinctura ferri ammoniati	Tinctura florum martialum
Ferrum tartarizatum	Mars solubilis. Tartarus martialis
Vinum ferri	Vinum chalybeatum. Vin. martis

Edinburgh.	*Dublin.*
	Acetas ferri
	Tinctura acetatis ferri
	Tinctura acetatis ferri cum alcohol
	Sulphuretum ferri
Ferula assa fœtida	Assa fœtida
tinctura	lac
	tinctura
pilulæ compositæ	Enema fœtidum
emplastrum	Pilulæ myrrhæ compositæ
Ficus carica	Carica
Fucus vesiculosus	Quercus marina
	pulvis
Fraxinus ornus; Manna	Manna
Gambogia	Gambogia
Gentiana lutea	Gentiana
extractum	extractum
infusum	infusum compositum
tinctura composita	tinctura composita
vinum compositum	
Geoffræa inermis	Geoffrœa
decoctum	
Geum urbanum	Geum urbanum
Glycyrrhiza glabra	Glycyrrhiza
extractum	extractum
Glycyrrhizæ glabræ trochisci	
cum opio	
Gratiola officinalis	Gratiola
Guaiacum officinale	Guaiacum
tinctura	tinctura
ammoniata	ammoniata
decoctum compositum	Aqua calcis compositum
Hæmatoxylum campechianum	Hæmatoxylum
extractum	extractum
Helleborus niger	Helleborus niger; melampodium
extractum	extractum
tinctura	tinctura
Helleborus fœtidus	Helleboraster
Hirudo medicinalis	Hirudo medicinalis
Hordeum distichon	Hordeum distichum
decoctum	decoctum
	compositum

London.	*Various.*
	Extractum martis
Liquor ferri alkalini	
Assæfœtidæ gummi resina	
Mistura assafœtidæ	
Tinctura assafœtidæ	Tinctura fœtida
	Pilulæ gummosæ
	Emp. antihystericum
Carica	
Fucus	
Manna	Æthiops vegetabilis
	Manna calabrina
Cambogia	Stalagmitis gambogioides. *L. D*
Pilulæ gambogiæ comp.	Gummi guttæ
Gentiana	Gentiana rubra
Extractum gentianæ	
Infusum gentianæ comp.	Infusum amarum simplex
Tinctura gentianæ comp.	Tinctura amara, Elixir stomachicum
	Vinum amarum
	Geoffroya inermis. *Dub.*
	Caryophyllata
Glycyrrhiza	Radix liquiritiæ
Extractum glycyrrhizæ	Succus liquiritiæ depuratus
	Trochisci becchici nigri
Guaiacum	Lignum sanctum
Tinctura guaiaci	Elixir guaiacinum
ammoniata	Elixir guaiacinum volatile
	Decoctum lignorum
Mistura guaiaci	Lac guaiaci
Hæmatoxylon	Lignum Campechense
Extractum hæmatoxyli	Extractum ligni Campechensis
Helleborus niger	Melampodium
	Extractum melampodii
Tinctura hellebori nigri	Tinctura melampodii
Helleborus fœtidus	
Hordeum	
Decoctum hordei	Aqua hordeata
compositum	Decoctum pectorale
Cerevisiæ fermentum	

Edinburgh.	*Dublin.*
Humulus lupulus	
Hydrargyrus	Hydrargyrum
purificatus	purificatum
pilulæ	pilulæ
Hydrargyri emplastrum	
unguentum	Hydrargyri unguentum
	mitius
	Hydrargyrum cum magnesia
	creta
Hydrargyri acetis	Acetas hydrargyri
murias	Murias hydrargyri corrosivum
sub-murias	Sub-murias hydrargyri sublimatum
præcipitatus	præcipitatum
	ammoniatum
	unguentum
oxidum cinereum	Pulvis hydrargyri cinereus
unguentum	
	Oxydum hydrargyri
rubrum per acidum nitricum	nitricum
rubri unguentum	Sub-nitratis hydrargyri unguentum
nitratis ung. fortius	Super-nitratis hydrargyri unguent.
ung. mitius	
sub-sulphas flavus	Oxydum hydrargyri sulphuricum
sulphuretum nigrum	Sulphuretum hydrargyri nigrum
sulphuretum rubrum	hydrargyri rubrum
Hyosciamus niger	Hyosciamus
succus spissatus	succus spissatus
tinctura	tinctura
Hyssopus officinalis	Hyssopus
Inula helenium	Enula campana
Ipecacuanha	Ipecacuanha
Ipecacuanhæ et opii pulvis	Ipecacuanhæ pulvis compositus
vinum	vinum
Iris Florentina	
Juniperus communis	Juniperus
Juniperi spiritus compositus	Juniperi spiritus compositus
oleum volatile	oleum essentiale
Juniperus lycia, resina	Olibanum
sabina	Sabina

London.	*Various.*
Cataplasma fermenti	
Humulus	
Extractum humuli	Extractum lupuli
Tinctura humuli	
Hydrargyrus purificatus	Argentum vivum ; Mercurius
Pilulæ hydrargyri	Pilulæ cœruleæ
Emplastrum hydrargyri	Emp. lithargyri cum hydrarg.
Unguentum hydrargyri fortius mitius	Unguentum cœruleum fortius mitius
Linimentum hydrargyri	
Hydrargyrus cum creta	Mercurius alkalisatus
Hydrargyri oxymurias	Mercurius corrosivus sublimatus
Liquor hydrargyri oxymuriatis	Liquor bellostii
Hydrargyri sub-murias	Calomelas. Panacea merc.
Pilulæ hydrargyri sub-muriatis	Pilulæ plummeri præcipitatus dulcis
Hydrargyrus præcipitatus albus	Mercurius cosmeticus Unguent. e mercurio præcip.
Hydrargyri oxydum cinereum	Mercurius solubilis
oxydum rubrum nitrico-oxydum	Mercurius calcinatus præcipitatus ruber
Unguentum hydrargyri nitr. oxydi nitratis	Unguentum citrinum
	Turpethum miner. Merc. emet. flav. Æthiops mineralis ; Pulv. hypnot.
Hydrargyri sulphuretum rubrum	Cinnabaris factitia
Hyosciamus	
Extractum hyosciami	
Tinctura hyosciami	
Ipecacuanha	Callicocca, *or* cephaëlis ipecacuanha
Pulvis ipecacuanhæ comp.	Pulvis Doveri
Vinum ipecacuanhæ	
Juniperus	
Spiritus juniperi compositus	Aqua juniperi composita
Oleum juniperi	
Olibanum	Thus
Sabina	

Edinburgh.	*Dublin.*
Juniperus oleum volatile	Sabina oleum essentiale
	extractum
	unguentum
Kino	Kino
tinctura	tinctura
Lactuca virosa	
succus spissatus	
Lavandula spica	Lavandula
spiritus	spiritus
compositus	compositus
oleum volatile	oleum essentiale
Laurus camphora; camphora	Camphora
Tinctura camphoræ	Spiritus camphoratus
Emulsio camphorata	Mistura camphorata
Oleum camphoratum	Oleum camphoratum
Laurus cassia	Cassia lignea
aqua destillata	
Laurus cinnamomum	Cinnamomum
aqua destillata	aqua
spiritus	spiritus
tinctura	tinctura
composita	composita
Laurus nobilis	
sassafras	Sassafras
oleum volatile	oleum essentiale
Leontodon taraxacum	Taraxacum
	extractum
Lichen Islandicus	Lichen islandicus
	decoctum
Lichen rocella	Litmus
Linum usitatissimum	Linum
oleum	oleum
Linum catharticum	Linum catharticum
Lobelia syphilitica	
Lythrum salicaria	Lythrum salicaria
Magnesia	Magnesia usta
carbonas	Magnesia
sulphas	Sulphas magnesiæ
Malva silvestris	
Manganesium	Manganesium
Mel	Mel
	despumatum

London.	*Various.*
Ceratum sabinæ	
Kino	{ Eucalyptus resinifera, *Ed.*;
Tinctura kino	{ Butea frondosa, *Dub.*
Pulvis kino comp.	
	Lactuca sylvestris
Lavandula	
Spiritus lavandulæ compositus	Spiritus lavend. simp.
Oleum lavandulæ	Oleum spicæ
Camphora	
Spiritus camphoræ	Spiritus vinosus camphoratus
Mistura camphoræ	Julepum e camphora
Linimentum camphoræ comp.	Linimentum camphoræ
	Xylocassia. Can. Malab.
Cinnamomum	Cannella
Aqua cinnamomi	Aqua cinnamomi simplex
oleum	
Spiritus cinnamomi	Aqua cinnamomi spirituosa
Tinctura cinnamomi composita	Tinctura aromatica
Laurus	
Sassafras	
Taraxacum	Dens leonis
Extractum taraxaci	
Lichen	Muscus Islandicus
Decoctum lichenis	
	Lacmus tinctorius
Linum usitatissimum	
Oleum lini	
Infusum lini	
Linum catharticum	
Magnesia	
Magnesiæ carbonas	
sulphas	Sal catharticum amarum
Malva	
	Magnesia vitriariorum
Mel	
despumatum	

Edinburgh.	*Dublin.*
	Oxymel
Marrubium vulgare	Marrubium album
Melaleuca leucadendron, oleum	Oleum cajeput
Melissa officinalis	
Meloe vesicatorius	Cantharis
tinctura	tinctura
pulveris unguent.	unguentum
infusi unguentum	
emplastrum	Cantharidis emplastrum
Meloes vesicatorii emplast. comp.	
	Emplastrum calefaciens
Mentha piperita	Mentha piperitis
aqua destillata	aqua
spiritus	
oleum volatile	oleum essentiale
Mentha pulegium	Pulegium
aqua destillata	aqua
	oleum essentiale
Mentha viridis	Mentha sativa
	oleum essentiale
	aqua
	infusum compositum
Menyanthes trifoliata	Trifolium paludosum
Mimosa catechu, extractum	Catechu
electuarium	electuarium compositum
tinctura	tinctura
infusum	
Mimosa nilotica, gummi	Gummi arabicum
mucilago	mucilago
emulsio	Emulsio arabica
Momordica elaterium	Cucumis agrestis
succus spissatus	Elaterium
Morus nigra	
Moschus moschiferus; Moschus	Moschus
	tinctura
Myristica moschata; Nux moschata	Nux moschata
spiritus	spiritus
Myroxylon Peruiferum; Balsamum	Balsamum Peruvianum
Myrrha	Myrrha
tinctura	tinctura
Myrtus pimenta	Pimento; Piper Jamaicense
aqua destillata	aqua

London.	*Various.*
Oxymel	Oxymel simplex
Marrubium	
Cajuputi oleum	Melaleuca cajuputi. *Lond.*
Lytta	Lytta vesicatoria. *Lond.*
Tinctura lyttæ	
Ceratum lyttæ	Unguentum epispasticum fortius
	Unguentum epispasticum mitius
Emplastrum lyttæ	Emplastrum vesicatorium
Mentha piperita var. *α.*	
Aqua menthæ piperitæ	Aqua menth. pip. simplex
Spiritus menthæ piperitæ	spirituosa
Oleum menthæ piperitæ	
Pulegium	
Aqua pulegii	
Oleum pulegii	
Spiritus pulegii	
Mentha viridis	
Oleum menthæ viridis	
Aqua menthæ viridis	Aqua menthæ vulgaris simplex
Spiritus menthæ viridis	spirituosa
Menyanthes	Trifolium palustre
Catechu extractum	Acacia catechu. *L.* Terra Japonica
	Confectio Japonica
	Tinctura Japonica
Infusum catechu	Infusum Japonicum
Acaciæ gummi	Acacia vera. *L.* Gummi Senegal
Mucilago acaciæ	
Elaterii poma	
Extractum elaterii	
Morus	
Syrupus mori	
Moschus	
Mistura moschi	Julepum e moscho
Myristicæ nuclei	
Spiritus myristicæ	Aqua nucis moschatæ spirituosa
Balsamum Peruvianum	Balsamum Indicum nigrum
Myrrha	
Tinctura myrrhæ	
Pimentæ baccæ	Piper Jamaicense
Aqua pimentæ	Aqua pimentæ spirituosa

Edinburgh.	*Dublin.*
Myrtus spiritus	Pimento spiritus
oleum volatile	oleum essentiale
Nicotiana tabacum	Nicotiana
vinum	
Olea Europæa; oleum	Oleum olivarum
Oleum ammoniatum	Ammoniæ linimentum
Oleum sulphuratum	
Oniscus asellus	Millepedæ
Opium	Opium
	extractum aquosum
	purificatum
tinctura	tinctura
ammoniata	
	tinctura camphorata
	syrupus
Electuarium opiatum	
Pilulæ opiatæ	Pilulæ e styrace
Pulvis opiatus	
Origanum majorana	Majorana
Origanum vulgare	Origanum
	oleum essentiale
Ostrea edulis	Ostrearum testæ præparatæ
Oxalis acetosella	
Ovis aries; sevum	Sevum ovillum
Papaver somniferum	Papaver album
extractum	
syrupus	syrupus
Papaver rhocas	Papaver erraticum
	syrupus
Pastinaca opoponax; gummi resina	
Phasianus gallus	
	Ovorum testæ præparatæ
Pimpinella anisum	Anisum
oleum volatile	oleum essentiale
	spiritus compositus
Pinus abies, resina aponte concreta	Pix Burgundica
	Emplastrum aromaticum

London.	*Various.*
Spiritus pimentæ	
Oleum pimentæ	
Tabacum	
Infusum tabaci	
Olivæ oleum	
Linimentum ammoniæ fortius	
carbonatis	Linimentum volatile
Oleum sulphuratum	Balsamum sulphuris crassum
Opium	
Extractum opii	Extract. thebaicum. Opium colatum
Tinctura opii	Tinctura thebaica. Laudan. liquidum
	Elixir paregoricum. *Ed.*
camphoræ composita	paregoricum *Lond. Dub.*
Emplastrum opii	
Vinum opii	Laudanum liquidum Sydenhami
Confectio opii	Philonium Londinense
Pilulæ saponis cum opio	Pilulæ thebaicæ
Origanum	
Oleum origani	
Ostrea	
Testæ præparatæ	
Acetosella	Lujula
Sevum	
Sevum præparatum	
Papaveris capsulæ	
Extractum papaveris	
Syrupus papaveris	Syrupus diacodion; Syr. e meconio
Decoctum papaveris	
Rhœados petala	
Syrupus rhœados	
Opoponax	
Ovum	
Anisum	
Oleum anisi	
Spiritus anisi	
Pix arida	
Picis aridæ unguentum	Unguentum basilicum nigrum
Emplastrum picis compositum	Emplastrum cephalicum
Abietis resina	Thus

Edinburgh.	*Dublin.*
Pinus balsamea, resina liquida	Balsamum Canadense
larix, resina liquida	Terebinthina Veneta
sylvestris, resina empyreum.	Pix liquida
Picis unguentum	unguentum
	Picis liquidæ aqua
	Terebinthina vulgaris
Pini oleum volatile	Oleum terebinthinæ
purissimum	rectificatum
Pini resina	Resina flava; resina alba
Emplastrum simplex	
Unguentum resinosum	Unguentum resinæ albæ
Emplastrum resinosum	Litharg. emp. cum resina
Piper longum	Piper longum
Piper nigrum	Piper nigrum
	unguentum
Pistacia terebinthus	
Pistacia lentiscus, resina	
Plumbum	
oxidum album	Cerussa; sub-acetas plumbi.
unguentum	sive sub-acetatis plumbi
	unguentum
oxidum semi-vitreum	Lythargyrum
emplastrum	Lithargyri emplastrum
	Liquor sub-acetatis lithargyri
	Lithargyri sub-acetatis liquor comp.
acetis	Acetas plumbi
acetetitis unguentum	Acetitis plumbi unguentum
oxidum rubrum	
Polyala senega	Seneka
decoctum	
Polygonum bistorta	Bistorta
Polypodium filix mas	Filix mas
Potassa	Kali causticum
cum calce	cum calce
aqua	aqua
carbonas	sub-carbonas
purissimus	e tartaro
impurus	Cineres clavellati; kali impurum
	Aqua sub-carbonatis kali
super-carbonatis aqua	
acetis	Kali acetas
sulphas	sulphas

London.	*Various.*
Terebinthina canadensis	
Pix liquida	
Picis liquidæ unguentum	
Terebinthina vulgaris	
Linimentum terebinthinæ	
Terebinthinæ oleum	
Oleum terebinthinæ rectificatum	Oleum tereb. æthereum
Resina flava	Resina alba, *Edin.* Colophonium
Emplastrum ceræ	Emp. cereum. Cerat. citrin.
Ceratum resinæ	Ungt. basilicum flavum
Emplastrum resinæ	Emplastrum adhæsivum
Piper longum	
Piper nigrum	
Terebinthina Chia	
Mastiche	
Plumbi carbonas	Sub-carbonas plumbi.
	Unguentum album
Plumbi oxydum semi-vitreum	Plumbum ustum
Emplastrum plumbi	Diachylon simplex
Liquor plumbi acetatis	Extractum saturni
dilutus	
Ceratum plumbi comp.	
Plumbi super-acetas	Saccharum saturni
Ceratum plumbi super-acetatis	Unguentum saturninum
	Plumbum ustum rubrum
Senega	
Decoctum senegæ	
Bistorta	
Filix	Aspidium filix mas. *Lond.*
Potassa fusa	Alkali vegetabile fixum causticum
cum calce	Causticum commune mitius
Liquor potassæ	Lixivium saponarium causticum
Potassæ subcarbonas	Sal absinthii
ex tartaro	Sal tartari
Potassa impura	Lixiva, Alk. fix. veget.
Liquor potassæ subcarbonatis	Lixivium tartari
Potassæ carbonas	
acetas	Sal diureticus
sulphas	de duobus. Arcanum duplicatum

Edinburgh.	*Dublin.*
Potassa sulphas cum sulphure	
sulphuretum	Kali sulphuretum
	aqua
tartris	tartaras
et sodæ tartris	Tartaras sodæ et kali
super-tartris	Chrystalli tartari
impurus	Tartarum
nitras	Nitrum, nitras kali
trochici	
	Aqua alcalina oxymuriatica
Prunus domestica	Prunus Gallica
Pterocarpus draco, resina	
santalinus	Santalum rubrum
Punica granatum	Granatum
Pyrus cydonia	
Quassia excelsa	Quassia
	tinctura
Quassia simaruba	Simarouba
Quercus cerris, cyniphis nidus	Gallæ
	tinctura
robur	Quercus
	extractum
Rhamnus catharticus	Rhamnus catharticus
syrupus	
Rheum palmatum	Rheum
tinctura	tinctura
et aloes tinctura	
et gentianæ tinctura	
infusum	
vinum	
pilulæ compositæ	
Rheum undulatum	Rheum undulatum
Rhododendron chrysanthum	
Rhus toxicodendron	
Ricinus communis	Ricinus
Rosa canina	
conserva	

London.	*Various.*
	Sal polychrestus glaseri
Potassæ supersulphas	
sulphuretum	Hepar sulphuris
tartras	Tartarum solub.
Soda tartarizata	Sal rupellensis. Sal polych. seignette
Potassæ supertartras	Tartarus purificatus
	crudus
nitras	Nitrum prismaticum
	Aqua oxymuriatis potassæ
Pruna (drupa siccata)	
	Sanguis draconis
Pterocarpi lignum	
Granatum	Balaustium
Cydoniæ semem	Cotonea
Decoctum cydoniæ	Mucilago cydoniorum
Quassia	
Infusum quassiæ	
Simarouba	
Infusum simaroubæ	
Gallæ	Cynipidum nidi, Cynips quercus folii
Quercus	Quercus pedunculata. *Lond.*
Decoctum quercus	
Rhamnus	Spina cervina
Syrupus rhamni	Syrupus domesticus
Rheum	Rhabarbarum
Tinctura rhei	Tinctura rhabarbari spirituosa
	Elixir sacrum
	Tinctura rhœi amara
Infusum rhei	
	rhabarbari vinosa
	Pilulæ stomachicæ
Extractum rhei	
Tinctura rhei composita	Extractum rhei aquosum
Toxicodendron	Toxicodendron
Ricinus	Palma christi. Cataputia major
Oleum ricini	Oleum de kerva. Ol. palmæ liquidum
Rosa canina	Cynosbatus
Confectio rosæ caninæ	Conserva fructus cynosbati

Edinburgh.	*Dublin.*
Rosa centifolia	Rosa damascena
aqua destillata	aqua
syrupus	
Gallica	Rosa rubra
	mel
conserva	conserva
infusum	infusum
syrupus	
Rosmarinus officinalis	Rosmarinus
spiritus	spiritus
oleum volatile	oleum essentiale
Rubia tinctorum	Rubia
Rumex aquaticus	Rumex aquaticus
acetosa	
Ruta graveolens	Ruta
extractum	extractum
	oleum essentiale
Saccharum officinarum	Saccharum
Syrupus simplex	Syrupus simplex
Sagapenum	Sagapenum
Salix alba	Salix
fragilis	Salix fragilis
caprea	
Salvia officinalis	Salvia
Sambucus nigra	Sambucus
	unguentum
succus spissatus	succus spissatus
Sapo albus Hispanus	Sapo durus Hispanicus
tinctura	Saponis linimentum
et opii tinctura	
Emplastrum saponaceum	emplastrum
Scilla maritima	Scilla
exsiccata	Scillæ pulvis
acetum	acetum
syrupus	oxymel
	tinctura
	cum zingibere pilulæ
Pilulæ scilliticæ	
Scrophularia nodosa	Scrophularia
Sium nodiflorum	Sium
Sinapis alba	Sinapi
	cataplasma
Sisymbrium nasturtium	
Smilax sarsaparilla	Sarsaparilla

London.	*Various.*
Rosa centifolia	Rosa pallida
Aqua rosæ	
Syrupus rosæ	Syrupus rosarum solutivus
Rosa Gallica	
Mel rosæ	Mel rosaceum
Confectio rosæ gallicæ	
Infusum rosæ	Tinctura rosarum
Rosmarinus	
Spiritus rosmarini	
Oleum rosmarini	
Rubia	
	Britannica; Hydolapathum
Acetosa	
	Oleum rutæ æthereum
Confectio rutæ	Electarium e baccis lauri
Saccharum	
Syrupus	Syrupus communis
Sagapenum	Serapinum
Salix caprea	
	Herba salviæ minoris
Sambucus	
unguentum	
	Roob baccarum sambuci
Sapo durus	Sapo ex olivæ oleo et soda confectus
Ceratum saponis	
Linimentum saponis compositum	Balsamum saponaceum
	anodynum
Emplastrum saponis	Emplastrum e sapone
Sapo mollis	Sapo ex oleo et potassa confectus
Scilla	Squilla
	Scilla præparata
Acetum scillæ	Acetum scilliticum
Oxymel scillæ	Oxymel scilliticum
Tinctura scillæ	Essentia squillæ
Pilulæ scillæ comp.	
Sinapis	Sinapis nigra
Cataplasma sinapis	Sinapismus
	Nasturtium aquaticum
Sarsaparilla	

Edinburgh.	*Dublin.*
Smilax sarsaparilla decoctum	Sarsaparilla decoctum compositum
Sodæ carbonas impurus	Barilla, soda impura
carbonas	Sodæ carbonas siccatum
super carbonatis aqua	
phosphas	phosphas
sulphas	sulphas
murias	Sal commune; murias sodæ
	Murias sodæ siccatum
boras	Borax, sub-boras sodæ
Solanum dulcamara	Dulcamara
Solidago virga aurea	Virga aurea
Spartium scoparium	Genista extractum
Spigelia Marilandica	Spigelia
Spermaceti	Sperma ceti
	Spermatis ceti unguentum
Ceratum simplex	
Spongia officinalis	Spongia
	ustæ pulvis
Stannum	Stannum pulvis
Styrax Benzoin; Balsamum	Benzoe
tinctura composita	tinctura composita
officinalis; Balsamum	Styrax calamita purificata
Succinum	Succinum
oleum	oleum
purissimum	rectificatum
Sulphur	
Sulphur sublimatum	Sulphur sublimatum
lotum	lotum
unguentum	unguentum
Sus scrofa, adeps	Adeps suillus præparatus
Swietenia febrifuga	Swietenia febrifuga
mahagoni	
Tamarindus Indica	Tamarindus
infusum, cum senna	Infusum sennæ cum tamarindis
Tanacetum vulgare	Tanacetum

London.	*Various.*
Decoctum sarsaparillæ compositum	
Extractum sarsaparillæ	
Soda impura	Natron impurum
Sodæ subcarbonas	Sal sodæ. Alcali minerale aëratum
subcarbonas exsiccata	
carbonas	
sulphas	Sal catharticus Glauberi
murias	Muria; sal commune
boras	Sub-boras sodæ. *Lond. Syn.*
Mel boracis	
Dulcamara	Solanum scandens
Decoctum dulcamaræ	
Spartium	
Spigelia	
Cetaceum	Physeter macrocephalus
Unguentum cetacei	Linimentum album
	Ceratum album
Spongia	
usta	
Stannum	
Benzoinum	Assa dulcis
Tinctura benzoini composita	Balsamum traumaticum
Styracis balsamum	
Succinum	Electrum, carabe
Oleum succini	
Sulphur	
sublimatum	
lotum	
præcipitatum	
Sulphuris unguentum composit.	Unguentum antipsoricum
Adeps	
præparata	
Tamarindus	

Edinburgh.	*Dublin.*
Teucrium chamædrys	Chamædrys
Teucrium marum	Marum syriacum
Toluifera balsamum ; Balsamum	Balsamum Tolutanum
tinctura	tinctura
syrupus	
Tormentilla erecta	Tormentilla
Triticum hybernum	
Amylum	Amylum
Mucilago amyli	Mucilago amyli
Trochisci gummosi	
Tussilago farfara	Tussilago
Valeriana officinalis	Valeriana
	tinctura
	ammoniata
	extractum
	infusum
Veratrum album	Helleborus albus
	unguentum
tinctura	
Veronica beccabunga	Beccabunga
Vinum album Hispanum	
Viola odorata	Viola
syrupus	syrupus
Vitis vinifera	Uvæ passæ sole siccatæ
Ulmus campestris	Ulmus
	decoctum
Wintera aromatica	
Zincum	Zincum
oxidum	Oxydum zinci
unguentum	unguentum
oxidum impurum	Tutia
oxidum imp. præparatum	
unguentum	Unguentum tutiæ
carbonas impurus	Calaminaris
præparatus	Lapis calaminaris præparatus
ceratum	unguentum
sulphas	Sulphas zinci
solutio	
acetitis solutio	Tinctura acetatis zinci

Note.—The articles in italics in the first column are the scientific

London.	*Various.*
Balsamum Tolutanum	Balsamum de Carthagena
Syrupus Tolutanus	Syrupus balsamicus
Tormentilla	Tormentilla officinalis. *Lond.*
Amylum	
Mucilago amyli	
	Troschisci bechici albi
Farina	
Tussilago	
Valeriana	
Tinctura valeriana ammoniata	Tinctura valerianæ volat.
Veratrum	
Decoctum veratri	
Veratri unguentum	
Vinum (sherry)	
Viola	Viola martialis
Uvæ passæ	
Ulmus	
Decoctum ulmi	
	Winteranus cortex
Zincum	
Zinci oxidum	Flores zinci
Zinci unguentum	
Calamina præparata	Cadmia fossilis
Ceratum calaminæ	Ceratum epuloticum
Zinci susphas	Sal vitrioli; Chalcanthum album
	Aqua vitriolica

ames of articles not in the Edinburgh Pharmacopœia.

TABLE,

SHEWING THE PROPORTION OF ANTIMONY, OPIUM, AND QUICKSILVER, CONTAINED IN SOME COMPOUND MEDICINES.

TARTRITE OF ANTIMONY.

Wine of tartrite of antimony contains two grains of tartrite of antimony in the ounce.

OPIUM.

Opiate electuary contains in each drachm about a grain and a half of opium.

Electuary of catechu contains in each ounce about two grains and a half of opium; for one grain of opium is contained in one hundred and ninety-three grains.

Powder of ipecacuan and opium contains six grains of opium in each drachm, or one grain in ten.

Opiate powder contains one grain of opium in ten.

Opiate pills contain six grains of opium in each drachm, or five grains contain half a grain of opium.

Tincture of opium is made with two scruples of opium in each ounce of the liquid, or with five grains in each drachm. But a drachm of the tincture appears, by evaporation, to contain about three grains and a half of opium.

Ammoniated tincture of opium is made with about eight grains of opium in each ounce of the liquid, or with about one grain in the drachm.

Tincture of soap with opium is made with about fifteen grains of opium in each ounce of the liquid.

Troches of liquorice with opium contain about one grain of opium in each drachm.

Camphorated tincture of opium contains nearly one grain of opium in three drachms.

QUICKSILVER.

Quicksilver pills contain fifteen grains of quicksilver in each drachm. Each pill contains one grain of quicksilver.

Quicksilver ointment contains about twenty-five grains of quicksilver in each drachm.

Mild quicksilver ointment contains twelve grains of quicksilver in each drachm.

Quicksilver plaster contains about sixteen grains of quicksilver in each drachm.

Ointment of nitrate of quicksilver contains in each drachm four grains of quicksilver and eight of nitrous acid.

Milder ointment of nitrate of quicksilver contains in each scruple half a grain of quicksilver, and one grain of nitrous acid.

Ointment of the sub-muriate of quicksilver and ammonia contains in each drachm about four and a half grains of the oxide.

A GLOSSARY

OF

BOTANICAL TERMS USED IN THIS WORK.

Aggregate. When a number of little flowers or florets are so disposed as to form one compound flower; all of them either enclosed within one common calyx, or situated upon one common receptacle. Thus the flowers of parsley and daisy are aggregate, having several small flowers or florets combining to form one large flower.

Aloe. Wings.

Alternate. Branches or leaves, or flowers springing out regularly one above another.

Angular. Stem having edges or corners, opposed to cylindrical. A stem or stalk may have one, two, three, four, or more angles or corners. Angular capsule as in flower de luce or flag.

Annual. Living only one year.

Anther, or *Anthera.* A box at the upper extremity of the filaments which contains the farina or fructifying dust.

Apex. The point, end, or termination of a leaf, &c.

Articulated. Jointed.

Auriculated. Ear shaped: also having an appendage.

Axillary. Growing out of the angles formed by the branches and the stem, or between the leaf and the stem, on the upper and inner side.

Base. That part of a leaf, &c. nearest to the branch or stem.

Base of the leaves or branches. Flowers or fruit stalks are often said to grow at the base of the leaves on the branches; that is when they are placed at the bottom of a leaf or branch, and on the inner side where it joins to the stem. The same as axillary.

Biennial. Continuing alive two years.

Bifid. Divided into two parts.

Blossom. One of the parts of a flower. It may consist of one or more *petals;* and is formed by an expansion of the inner bark of the plant.

Bulbous, root as *garlic* and *onion;* it is either

Solid as in the tulip and turnip,

Scaly as in the lily,

Coated as in the onion.

Calyx, or empalement, is that outer part of a flower, formed of one or more green or yellowish green leaves sustaining the corolla at the bottom and enclosing it entirely before it expands.

Capsule. A dry hollow vessel containing the seed or fruit.

Catkin, is a composition of flowers and chaff on a long slender, thread-shaped, receptacle; the figure of the whole resembling a cat's tail.

Concave. Hollowed out like a bowl, as the petals of the cherry or the hawthorn; and the broad leaved plantain.

Cone, or strobile. A species of seed vessel formed by a catkin with hardened scales; containing a seed within the base of each scale; as in the pine or fir.

Convex. Opposed to concave: rising like the surface of a globe.

Cordate. Heart shaped.

Corolla. Blossoms, petals, or flower leaves, is that beautiful part of a flower which first draws the attention as the flower itself.

Cortex. Back or covering.

Corymbus, or corymb. A broad spike, the flowers of which it is composed not sitting but standing each on its proper fruit stalk, each of which again spring out of one common fruit stalk.

Cup. A species of calyx contiguous to the other parts of the flower. It either includes one flower as in the convolvulus and gilly flower; or several florets as in the sun-flower and daisy.

Cylindrical, or round like a walking-stick. The form of the trunk of a tree.

Decumbent. Lying down or declining.

Drupa. A pulpy seed vessel; stone fruit as the plum, the cherry, and the peach.

Egg-shaped, signifies a shape resembling the solid substance of an egg; or in respect to leaves it implies only the form of an egg, divided long wise.

Fibrous. Composed of small threads or fibres.

Filament. The thread shaped part of a stamen, supporting the anther.

Flower. A temporary part of a plant appropriated to the production of seeds. It is composed of seven parts; the calyx; the blossom; the stamins; the pistils; the seed vessel; the seeds and the receptacle.

Florets. Small flowers, of which a compound flower is composed; thus the dandelion, daisy, and sun-flower, are compound flowers, formed by numerous florets, or simple flowers.

Fruit stalk. A part of the stem or branch, bearing flowers but not leaves.

Fructification. The flower and fruit of plants; the whole process of perfecting the fruit.

Genus, (genera.) The second subdivision of plants; it comprehends an assemblage of species under the same class and order.

Germen, or seed-bud. The lower part of a pistil, and is destined to contain the embryo seed.

Heart-shaped. A term used to express the form of a petal or leaf, which resemble a heart divided length wise.

Herbaceous (herbaceous) stem; one that is succulent and tender, in opposition to one that is woody; it perishes annually down to the root.

Husk. The calyx and the blossoms of grasses are called husks.

Indented. The edges of an indented leaf are hollowed, or deeply scolloped, the lobes standing asunder, as if part of the leaf had been cut out. The leaf of the oak or the turnip are familiar examples.

Indigenous. Native to a country.

Inflated. Distended, as if inflated like a blown up bladder.

Inversely-heart shaped. Leaves, &c. are so shaped, when the point of the heart is next to the stem.

Involucre, or fence; the little leaves which surround the base of rays that form an umbel. It is the calyx of an umbel.

Lateral. Growing from the sides of the stems or stalks.

Ligneous. Woody.

Linear. Strap-shaped.

Lobed. Divided, or lip-shaped.

Midrib. The prineipal nerve which runs from the base towards the end of a leaf along its middle.

Oblong. Considerably longer than broad, and narrowed, though rounded at the ends; as the leaves of the daisy.

Ovate, or *oval.* Egg-shaped.

Panicle. A kind of loose bunch, in which the flowers grow irregularly, and rather scattered; as in oats, &c.

Pedicle. A short foot stalk, or partial fruit stalk, being that part of a compound or branched fruit stalk, which is the immediate support of a single flower, or floret, or spiket.

Peduncle. A stem or foot stalk supporting one or more flowers.

Pendulus. Hanging down, as the bunches of the red currant, and the cones of the Scotch fir.

Perennial. Continuing for several years; at least more than two, and regerminating several years successively.

Perianthium. A kind of calyx or cup.

Permanent cup; remaining till the fruit is ripe; as in currant and pink.

Petals. The leaves which constitute the blossoms or flowers are so called to distinguish them from the other leaves of the plant.

Petiols. Leaf stalk.

Pistil, or *pointal.* A part of a flower, composed of the germen, the style and the summit. In the centre of the blossom of the white lily, the pistil stands surrounded by six stamens. In this flower the germen, which is the lower part of the pistil, is long, cylindrical, and marked with six furrows; next above this part is the style, which is long and cylindrical; and at the top of the style is the summit, which is thick and triangular.

Plaited. Folded in plaits.

Pod. A seed vessel of two valves, within which the seeds are fixed alternately to each seam.

Pollen, Farina, or dust; a fine powder contained in the anthers of flowers. The fecundating or fructifying dust.

Protuberances, in seed vessels; occasioned by the swelling of the enclosed seeds. They are sufficiently evident in the pods of mustard, and in some sorts of beans.

Racemus. A bunch, as of grapes or currants.

Radicalis. Issuing immediately from the root.

Receptacle. The base or seat upon which the other parts of a flower are placed. The inner part of a capsule to which the seeds are attached, is also called a receptacle.

Reflected. Bent back, rather angularly, as the segments of the cup of the currant; the petals of the flower de luce; the blossoms of the hyacinth and white lily.

Seed vessel. (Pericarpium.) A vessel to contain the seed. It is of several kinds; as a capsule, a pod, a legu-

men, an air-bag, a drupa, including a nut or stone; a pomum, a berry, and a cone.

Segments. The small part of a leaf cup or petal, included between the incision.

Serrated. Notched like a common saw.

Sessile. Setting upon the stalk.

Sinuate. [See Indented.]

Solitary. Only one in a place; as but one flower on a fruit stalk; or only one fruit stalk, proceeding from the same part of a plant.

Spathe. A spadia, sheath, or receptacle.

Spear-shaped. Applied to a leaf, signifies that it is shaped like a spear or lance.

Spherical. Globular.

Spike. A head or ear, as in rye, barley, wheat, &c.

Spindle-shaped. A gradually tapering root, as carrot and radish.

Spina. A thorn.

Spinosus. Thorny.

Stalk. That species of trunk which elevates and supports the flowers, but not the leaves of a plant. It differs from the fruit stalk, for that springs from the stem or branches; but this rises immediately from the root.

Stamen, or *Chive.* Open the blossom of a tulip or a lily, and you will see six long threads or filaments, placed round the central pillar, with an anther on the top of each. One of these filaments, together with its anther, is called a stamen.

Stem. The proper trunk of a plant supporting the leaves, branches, and flowers. It rises immediately from the root.

Stigma. Summit or top of the pointal.

Striated. Channeled, furrowed.

Strobile. [See Cone.]

Style, or *shaft*, is a part of a pistil standing upon the germen, and supporting the summit.

Ternates (leaves) growing three together from the same point.

Truncate. Lopped or cut off.

Tuberous roots. Those that are knobbed, like the potatoe, peony, &c.

Tuft. A composition of flowers, in which a number of fruit stalks, proceeding from one common centre, rise to the same height; and these again shoot out other lit-

tle fruit stalks, which do not proceed from one central point.

Umbel. A composition of flowers, in which a number of slender fruit stalks proceed from the same centre, and rise nearly to the same height, so as to form a regular surface at the top. Hemlock, carrot, and low parsnip are examples. These are said to be umbelliferous plants.

Valve. The different pieces that compose a capsule are called valves.

Villous. Shaggy, rough, hairy.

Variety, is applied to such individual plants as differ in some circumstances from others of the same species, but not differing so essentially, or so permanently, as to induce us to reckon them as distinct species.

Whorls. This term is applied either to branches, leaves, or flowers, when they grow all round their respective stems, resembling in some measure the spokes round the nave of a wheel.

ENGLISH INDEX.

The following index is greatly amplified by the insertion of the different trivial or common names of each substance or compound, the systematic names being contained in the Latin index. By such arrangement the reader may with facility detect the article searched for, under the term most familiar to himself, and having turned to the page, its synonymy will be presented to his view.

A

Acetic acid 68
Acetous acid 125
distilled 388
strong 389
with squills . . . 496
Acetite of potass 398
lead 452
quicksilver 436
Acids 42. 121
Aconite 130
Acrid principle 70
Æthiops, mineral 451
Affinity 79
Agrimony 133
Albumen 56
Alcohol 71. 133
diluted 134
Alcornoque 370
Alder black 310
Alkalis 38 174
Alkali volatile 41. 407
Almond, sweet 139
milk 488
Aloes 136
hepatic 136
socotorine 136
Alum 348
burnt 420

Alum curd 546
Amber 318
Ammoniacum 138
milk 489
Ammonia 41
prepared 407
water of 409
Ammoniated alcohol . . . 406
fetid . . . 474
oil 469
tinctures . . . 517
tincture of opium . . 518
Ammoniaret of copper 430
Ammoniacal copper 430
Analysis 26
Angustura 142
Animal analysis 47
Anise 302
Antacids 121
Anthelmintics 123
Anti-hysteric plaster 562
Antimonial powder 424
wine 522
Antimony 352
butter of 425
crocus of 421
glass of 422
cerated . . . 423
golden sulphur of . . . 423
panacea of . . . 428
prepared 421
tartrite of . . . 426
Antispasmodics 100
Apple peru 205
Angelica 141
Ardent spirit 133
Argil 36
Aroma 69
Aromatics 102
Aromatic acetous acid . . . 496
ammoniated alcohol . . 517
electuary 532
species 527
sulphuric acid . . . 516
ether with alcohol . . 516
vinegar 496
Arrow root, Indian 264
Arsenic 288

Arsenical solution 457
of Fowler . . . 457
Artificial mineral waters . . 572
Ash-coloured powder of mercury . . 418
Assa fœtida . . . 219
Asarabacca 153
Astringents . . . 103
Attraction 27. 79
Avens 225
Azot 29

B

Balm 268
Balsam 62
anodyne 513
of benzoin . . . 346
canada 303
copaiva . . . 198
fir 303
Gilead . . . 140
Peruvian . . . 279
sulphur . . . 469
tolu 356
traumatic . . . 500
Ballston mineral waters . . . 572
analysis of . 568
Barbadoes tar 165
Barley 231
Basilicon ointment . . . 552
Basket salt 278
Bath, cold 640
warm . . . 643
Barytes 37
Bayberry 278
Bear's foot 228
Bear's whortleberry . . . 147
Beaver 177
Benne oil 339
Benjamin tree 346
Benzoin 346
Benzoic acid . . . 67. 389
Bismuth 163
Bistort, great 309
Bitter apple . . . 202
sweet 341
infusion . . . 482
principle . . . 80
wine 520
Blessed thistle 178

Blistering plaster . . . 566
Blood root . . . 331
Blue ointment 554
plaster . . . 563
vitriol 349
Boracic acid . . . 45
Borax 347
Boxwood . . . 200
Buckthorn, purging . . . 316
Burdock . . . 148
Burgundy pitch . . . 303
Butternut 245
Butterfly weed 154

C

Cabbage bark tree . . . 224
Cajeput tree . . . 267
oil 267
Calamine, prepared . . . 455
Calcination 87
Calico tree . . . 247
Calomel . . . 442. 446
Caloric 252
Camphor 59
Camphor, tree . . . 252
Camphorated acetous acid . . 497
oil . . . 470
Canella alba 167
Candleberry myrtle . . 278
Cantharis 269
Caraway 176
Carbon 31
oxide of . . . 32
acid of 32
Carbonate . . . 171
of ammonia . . . 407
barytes . . . 172
iron . . . 432
precipitated . . 432
lime . . . 172
indurated . . 172
mixture of . . 489
prepared . . 414
soft . . . 142
magnesia . . 416
potass . . 394. 395
pure . . 396
impure . . 173
soda . . . 402

Carbonate, of soda, impure . . 175
zinc, impure . . 176
prepared . 455
Carbonic acid gas . . . 583
Carburetted hydrogen gas . . 44. 584
Cardamom, lesser . . . 139
Cardiac confection . . . 532
Carrot, wild 208
Cascarilla 202
Cassia pod 176
tree . . . 176. 251
bark 251
flower buds . . . 251
water . . . 472
Castor 177
Castor oil 323
Catechu 271
Catalogue of new articles . . . 374
Cataplasms 545
Cataplasm of alum . . . 546
mustard . . 546
Cathartics 108
Caustic ley . . . 392
Caustic common, strong . . 393
mild . . 394
lunar . . . 429
Cedar, red . . . 247
Centaury, smaller . . . 180
Cerates 548
Cerate of acetated litharge, compound . 550
impure carbonate of zinc . 558
savin . . . 559
simple . . . 558
Ceruse 292
Chalk 172
prepared . . . 414
mixture . . . 489
powder . . . 528
Chalybeate wine . . . 519
Chamomile 142
Charcoal of wood . . . 169
Cherry tree, laurel . . 312
wild . . . 310
Cicuta 195
Cinchona of the Carribean islands . 188
common . . . 180
officinal . . . 180
red 180

Cinchona, yellow 180
Cinnabar, factitious . . . 451
Cinnamon tree 251
water 472
Citric acid 66
Classification, table of . . . 97
Clove tree 216
Coakum 300
Cochineal 191
Cockspur pepper 168
Coffee 193
Colocynth 202
Colomba 195
Coltsfoot 357
Columbo of Marietta . . . 221
Combustion 28
Compounds of acids, alkalis, and earths . 382
Concentration 89
Conserves 532
Conserve of oranges . . . 532
red rose buds . . . 532
Contrayerva 216
Copaiva tree 198
Copper 203
pills 540
preparations of . . . 430
Coral, red 415
Coriander 199
Corrosive sublimate 438
Cowhage 215
Cow parsnip, common 229
Crab, black clawed 167
Crab's eyes 167
Crane's bill 224
Craw fish 167
Cream of tartar 354
Crystalization 90
Crystals of tartar 354
Cuckow pint 152
Cunicum 300
Cure all 225
Currants 323

D

Damask rose water . . . 472
Damson, mountain . . . 314
Dandelion 255
Decoction 87

Decoctions . . . 480
Decoction of barley . . . 486
cinchona . . . 484
guaiacum, compound . 486
marsh mallow . . 484
mezereon . . 485
sarsaparilla . . 487
seneka . . . 486
the woods . . . 486
Deadly night-shade . . . 157
Decomposition . . . 83
Deflagration . . . 87
Deliquesce 90
Demulcents . . . 123
Diacodium 492
Diaphoretics . . . 115
Digestion 87
Dill 141
Diluents 125
Distillation . . . 75. 88
Distilled spirits . . . 471
waters . . . 472
Diuretics 113
Diuretic salt . . . 398
Dock curled 327
narrow . . . 327
water 326
Dogwood, common . . . 200
swamp or blue berried . 200
Doses of medicines . . . 576
Dover's powder . . . 529
Dragon root . . . 152

E

Earths 36
Earthy salts . . . 46
Effloresce 90
Elder, common . . . 331
Elecampane . . . 241
Electricity 587
Electuaries . . . 532
Electuary, aromatic . . 532
of cassia . . . 533
catechu . . . 534
opiate . . . 534
of senna . . . 533
Elixir of camphor . . . 501
guaiacum volatile . . 517

Elixir of health . . . 502
paragoric . . . 511
proprietatis . . . 499
stomachic . . . 505
of vitriol . . . 516
Elm American, (slippery) . . 358
Elutriation . . . 84
Emetics 105
Emetic weed . . . 258
tartar . . . 426
Emmenagogues . . . 112
Emollients 125
Emulsions 488
Emulsion of almonds . . . 488
ammoniacum . . 489
camphor . . . 488
Epispastics . . . 118
Epsom salt 350
Ergot 337
Errhines 118
Escharotics . . . 122
Essential salts . . . 459
Ether 72
Evaporation . . . 87
Expectorants . . . 116
Extraction 86
Extraction of pulps . . . 467
Extractive matter . . . 62
Extracts 524
Extract 63
of black hellebore . . 525
butter nut . . . 525
cinchona . . . 526
chamomile . . . 525
gentian . . . 524
jalap . . . 526
liquorice . . . 525
logwood . . . 525
rue . . . 525
senna . . . 525
white poppy . . 525
lead, Goulard's . . 453

F

Fecula 55
Fennel sweet . . . 140
Fern, male 309
Fetid tincture . . . 500

Fig tree 220
Fir Scotch . . . 304
Fixed fossil alkaline salt, purified . . 402
vegetable alkaline salt, purified . 394
Flag, blue 244
Flax, common . . . 257
Fluoric acid . . . 45
Flower de luce . . . 244
Flowers of benzoin . . . 389
sulphur . . . 351
washed . . 381
zinc . . . 454
Foxglove, common . . . 208
Fusion 87

G

Galbanum . . . 166
Gallic acid 65
Gall nut . . . 315
Galvanism 592
Gamboge . . . 223
Garget 300
Garlic 135
Gases 578
Gentian 223
Ginger 138
Glauber's salt . . . 404
Glauber's spirit of nitre . . . 383
Gluten 55
Gold 159
Golden thread . . . 283
Goulard's cerate . . . 550
Goat's thorn . . . 157
Granulation 84
Guaicum, officinal . . . 226
Gum 53
Gum arabic . . . 272
tragacanth . . . 157
pills . . . 539
plaster . . . 562

H

Hart 179
Hellebore, black . . . 228
fetid . . . 228
white . . . 360
Hemlock 195
Henbane, black 239

Herb Bennet . . . 225
Herb Christopher . . . 131
Hiera picra . . . 531
Hips 325
Honey 266
Hooded willow herb . . . 336
Hop, common . . . 231
Horehound, white . . . 266
wild . . . 217
Horse chesnut . . . 132
Horse raddish . . . 192
Hydrogen 30
gas . . . 583
Hydro-sulphuret of ammonia . . 411
Hyssop . . . 240

I

Indian physic . . . 343
poke . . . 360
tobacco . . . 258
turnip . . . 153
Indigo fera 342
Indigo weed . . . 342
Infusions 480
Infusion . . . 87
of catechu . . 482
cinchona . . 481
common foxglove . . 481
gentian, compound . . 482
rhubarb . . . 483
roses . . . 483
tamarinds and senna . . 483
Ipecacuan . . . 241. 343
Iron 218
filings of, purified . . 431
rust of . . . 432
scales of . . . 219
purified . . . 431
Isinglass . . . 128
Ivy 248

J

Jalap 197
Jamaica pepper . . . 281
Japonic infusion . . . 482
tincture . . . 508
Jerusalem oak . . . 179
Jimson weed 205

Juices, expressed and inspissated . 464
Juice inspissated of aconite or wolfsbane . 464
black henbane . 466
deadly nightshade . 465
hemlock . . 465
thorn apple . . 466
Juniper 245

K

Kermes mineral . . 424
Kino 248

L

Lady's plume . . . 287
Lambkill 248
Larch tree 303
Laurel, broad-leaved . . 247
dwarf 248
Lavender 255
thrift 345
Lead 306
red 292
white 292
Leech 230
Lemon tree . . . 189
Lenitive electuary . . 533
Lettuce, common garden . . 250
wild 250
Levigation . . . 84
Ley 87
Lime 37. 166
water 413
Liniments 548
Liniment of quicksilver, compound . 549
saponaceous . . 513
simple . . . 548
volatile . . . 469
Liquid laudanum . . . 510
Liquorice 225
Litharge 293
Lithontriptics . . . 122
Liver of sulphur . . . 400
Lixiviation . . . 87
Lobelia . . . 258. 262
Logwood tree . . . 227
Lunar caustic 429

M

Mace 278
Maceration 87
Madder 326
Magnesia 37. 419
alba 416
calcined . . . 419
Mahogany 355
Malic acid 66
Mallow, common . . . 264
Mandrake . . . 306
Manna 222
Marble 172
March violet 363
Marsh mallow . . . 137
rosemary . . . 345
Martial flowers . . . 434
May apple 306
Measures and weights . . 91
Medical prescriptions . . . 565
Medical electricity . . . 587
Medicated vinegars . . . 496
wines . . . 519
Mercury 232
Mercurial ointment . . . 554
strong . . . 554
mild . . . 554
pills 540
plaster . . . 563
Metallic salts 46
Metals 33
Mezereon 204
Mild epispastic ointment . . 553
ointment of quicksilver . . 554
Milder ointment of nitrate of quicksilver . 557
Milkweed 250
Mineral waters . . . 565
Minims 91
Mixture of iron compound (Griffith's) . 435
Monkshood 130
Moss, Iceland . . . 256
Motherwort 256
Mountain damson . . . 314
Mouthroot 283
Mucilages 488
Mucilage 53
of gum-arabic . . 490
gum-tragacanth . . 490

Mucilage of starch . . . 489
Muriatic acid . . . 44, 387
Muriate . . . 274
of ammonia . . . 275
and iron . . 434
antimony . . . 425
barytes . . . 411
quicksilver . . . 438
soda . . . 276
Musk 273
Mustard, common . . . 340
white . . . 340
cataplasm . . . 546
whey . . . 341
Myrrh 280

N

Narcotic principle . . . 70
Narcotics 97
Nettle, common . . . 359
Neutral salts 46
Nightshade, American . . 300
deadly . . . 157
woody . . . 341
garden . . . 159
Nitrate of potass . . . 284
silver . . . 429
Nitre 284
Nitric acid . . . 44, 384
Nitrous acid . . . 44, 383
diluted . . . 383
oxide gas . . . 581
Nitrogen gas 29
Nutmeg tree . . . 278

O

Oak 314
Jerusalem . . . 179
oriental . . . 314
poison . . . 321
Oats 162
Oils, expressed . . . 58
volatile . . . 58
Oil of almonds . . . 468
amber . . . 390
purified . . 479
benne seeds . . . 339
caraway . . . 477
camphorated . . . 470

Oil of linseed 468
with lime 469
mace 278
olive 286
savine 476
turpentine 303
rectified . . . 478
vitriol 127
volatile of anise seeds . . . 477
cinnamon 251
cloves 216
fennel seeds 478
juniper berries . . . 476
lavender 477
lemon 189
mace 278
pennyroyal . . . 478
peppermint . . . 476
pimento 478
pine, purified . . . 478
rosemary 477
sassafras 254
spearmint 478
Oily grain 339
preparations 468
Ointments 548
Ointment of acetite of lead . . 550
basilicon 552
grey oxide of quicksilver . 556
infusion of cantharides . . 553
nitrate of quicksilver . 557
milder . 557
nitrous acid . . 554
oxide of zinc . . . 558
impure . 558
powder of cantharides . . 553
quicksilver . . 553
milder . . 554
red oxide of quicksilver . 556
resinous . . . 552
of roses 551
rose water . . . 551
simple 548
of spermaceti . . . 549
sub-acetite of copper . 557
sub-muriate of quicksilver and ammonia 556
sulphur . . . 553
tar 552

Ointment of thorn apple . . 551
tutty . . . 558
verdigris . . 557
white oxide of lead . . 550
yellow . . . 557
Opium 293
cultivation of . . 647
Orange, Seville . . . 189
peel water . . . 472
Oxalic acid 67
Oxidation 28
Oxides 34
Oxide of antimony with phosphate of lime 424
sulphur by nitrate of potass 421
arsenic . . . 288
bismuth . . . 163
iron, black . . . 219
purified . . 431
red . . . 434
lead, red . . . 292
semi-vitrified . . 293
white . . 292
quicksilver, ash coloured . . 448
red by nitric acid . 449
zinc 454
impure . . 293
prepared . . 455
Oxygen 28
Oxygenation . . . 28
Oxygen gas . . . 580
Oyster 287

P

Palma christi . . 323
Palm oil 192
tree . . . 192
Paragoric elixir . . . 511
Pearl ashes . . . 173
barley 231
Pennyroyal . . . 271
water . . . 472
Pepper, black . . . 305
Jamaica . . 281
long . . . 305
Peppermint 270
water . . . 472
Peruvian bark . . . 180
Phosphate of lime, impure . . 416
soda . . . 403

Phosphoric acid . . . 45
Phosphorus 33
Pills, aloetic . . . 538
of acetite of lead and ipecacuan . 539
aloes and assa fœtida . . 538
coloquintida . . 538
myrrh . . 539
ammoniaret of copper . . 540
assa fœtida, compound . 539
opium 541
plummer . . . 543
quicksilver . . . 540
rhubarb, compound . . 542
squill 542
stomachic . . . 542
Pimento tree 281
water . . . 472
Pink, Carolina . . . 343
Pitch, Burgundy . . . 303
Plantain 305
Plasters 548
Plaster, adhesive . . . 562
of assa fœtida . . 562
common . . . 561
gum . . . 562
of quicksilver . . . 563
red oxide of iron . . 564
resinous . . . 562
compound . . 560
saponaceous . . . 563
of semi-vitrified oxide of lead . 561
simple . . . 559
of Spanish flies . . 560
compound . . 560
strengthening . . 564
Pleurisy root . . . 154
Poison berry tree . . . 267
Poison oak . . . 321
vine 320
Poke root . . . 360
weed 360
Ponderous spar . . . 349
Poppy white 293
Potass 39. 393
with lime . . . 394
Potassa 39
Potatoe fly 262
wild . . . 198

Poultice, linseed . . . 545
carrot . . . 546
fermenting . . 546
Powders 527
Powder of aloes with canella . . 531
asarabacca, compound . . 528
carbonate of lime, compound 528
cinnamon, compound . . 527
ipecacuan and opium, (Dover's) 529
jalap, compound . . 529
opiate . . . 530
of scammony, compound . . 530
super-sulphate of alumina and potass, compound . 530
tragacanth, compound . . 531
Precipitation 89
Prickly ash . . . 147
yellow wood . . . 368
poppy . . . 148
Pride of India or China . . . 267
Proof spirit . . . 134
Prunes, French 311
Prussic acid . . . 68
Buccoon 331
Pulps, extraction of . . . 467
Pulverization 84

Q

Quassia 313
Quicksilver 232
purified . . . 436
Quicklime 166

R

Raisins 363
Rattlesnake root . . . 307
Rectification 89
Red precipitated mercury . . 449
Refrigerants 120
Resin 61
of pine 316
Rhododendron, yellow flowered . 319
Rhubarb 317
Rochelle salt . . . 405
Rock oil 165
Rose, damask . . . 325
dog 325
red. . . . 324

Rosemary 325
Rubefacients 118
Rue 327

S

Saccharine matter . . . 57
Sacred elixir, ... 512
tincture 519
Saffron, common 201
Sage 330
Sago 287
Sal aeratus 395
ammoniac 275
polychrest 400
Salop 287
Salt of amber 390
hartshorn 407
steel 433
tartar 396
Salts, neutral 46
Salt petre 284
Saponaceous plaster . . . 563
Sarsaparilla 341
Sassafras 254
Saturation 85
Saturnine ointment . . . 550
Saunders red 313
Savine 246
cerate 559
Scammony 197
Scullcap, blue 336
Scurvy grass, garden . . . 193
Sea salt 276
Seneka 307
Senna 177
American . . . 177
Septfoil 357
Seltzer water 573
Setterwort 228
Sheep 287
Shrub yellow root . . . 367
Sialagogues 117
Sifting 84
Silex 36
Silkweed 156
Silver 149
Simples, collection and preservation of . 376
Sinapism 547

Skoke 300
Skunk cabbage 150
Snake root, Virginian . . . 149
weed 309
Soap, Spanish 333
castile 333
Soda 40
water 573
Soluble tartar 401
Solution 85
of acetite of zinc . . . 457
carbonate of ammonia . 409
muriate of barytes . . 413
lime . . 415
potass . . . 392
super-carbonate of iron . 433
potass . . 397
soda . 402
sulphate of copper compound. . 431
arsenic . . 457
Southern wood . . . 150
Spanish flies . . . 269
Spearmint 270
water . . . 472
Spermaceti 300
Spirit of ammonia . . . 406
fetid . . . 474
caraway . . . 473
cinnamon . . . 473
juniper, compound . . 474
lavender . . . 473
compound . . 507
mindererus . . . 409
nitrous ether . . 462
nitre dulcified . . . 464
nutmeg . . . 473
peppermint . . . 473
pimento . . . 473
rosemary . . . 473
sea salt . . . 387
spearmint . . . 473
vitriol, dulcified . . 461
wine 133
Sponge 344
Spruce fir 303
Spurge laurel . . . 204
Spurred rye 337
Squill 335
dried 335
pills . . 542

Squill vinegar 496
Stag 179
Starch 357
Stibium 352
Stimulants 105
Strong epispastic ointment . . 553
Strong mercurial ointment . . . 554
Stronties 38
Styptic powder . . . 431. 530
Sub-acetite of copper . . 347
Sub-borate of soda . . 347
Sublimation . . . 89
Sub-muriate of quicksilver . . . 442
precipitated 446
and ammonia . 447
Sub-sulphate of quicksilver, yellow . 450
Succinic acid, ... 390
Sugar 328
brown 328
cane . . . 328
double refined . . . 328
candy . . . 328
of lead 452
Sulphate of barytes . . . 349
copper . . . 349
iron . . . 433
dried . . . 434
magnesia . . 350
potass . . . 399
with sulphur . 400
soda . . . 404
zinc . . . 455
Sulphates 46
Sulphur 33
sublimed . . . 351
washed . . . 381
Sulphur ointment . . . 553
Sulphurated hydrogen . . 33
oil . . . 469
Sulphuric acid . . . 43. 127
diluted . . . 382
ether . . . 459
with alcohol . . 461
Sulphurous acid . . . 43
Sulphuret of antimony . . . 352
precipitated 423
prepared . . 421
potass . . . 400
quicksilver, black . . 451
red . . 451

Sumach, narrow-leaved . . . 320
Pennsylvanian . . 320
swamp . . . 321
Virginain (stags horn) . . 320
white 321
Super-sulphate of alumina and potass . 348
dried 420
Super-tartrite of potass . . . 354
impure . . 354
Swallow-wort 154
Sweet flag 131
Sweet-smelling balsam tree . . 279
Swietenia 355
Synthesis 27
Syrups 491
Syrup of balsam of tolu . . . 494
buckthorn . . . 493
damask roses . . . 493
ginger . . . 492
lemons . . . 492
marsh mallow . . 491
orange peel . . . 491
red roses . . . 494
simple 491
of squills . . . 494
violets 495
white poppies. . . 492

T

Tamarind tree (tamarinds) . . 355
Tannin 64
Tansy 356
Tar 304
ointment . . . 552
Tartar 354
Tartar emetic . . . 426
Tartaric acid . . . 67
Tartrite of antimony . . 426
potass . . 401
and soda . 405
Thebaic electuary . . . 534
pills . . . 541
tincture . . 521
Thorn apple . . . 205
Thoroughwort . . . 217
Tin 345
Tinctures 498
made with etherial spirits . 515
Tincture of aloes, etherial . 515

Tincture of aloes and myrrh . . 499
angustura . . . 502
aromatic . . . 507
of assa fœtida . . . 500
balsam of tolu . . 514
benzoin, compound . . 500
black hellebore . . 506
henbane . . 506
camphor . . . 501
cantharides . . . 508
strong . . 508
cardamom . . . 499
cascarilla . . . 501
castor . . . 502
compound . . 517
catechu . . . 508
cinchona . . . 502
compound . . 503
cinnamon . . 507
compound . . 507
colomba . . . 503
common foxglove . . 504
gentian, compound . . 505
guaiacum . . . 505
ammoniated (volatile) 517
hop 515
jalap . . . 504
kino . . . 506
lavender, compound . 507
muriate of ammonia and iron . 509
iron . . 509
musk . . . 509
myrrh . . . 510
opium . . . 510
ammoniated . . 518
camphorated . . 511
peruvian bark . . 502
Huxham's . 503
rhubarb . . . 512
bitter . . . 512
rhubarb, sweet . . 513
and aloes . . 512
and gentian . . 512
sacred . . . 519
of saffron . . . 504
senna compound . . 502
soap . . . 513
and opium . . 513
socotorine aloes . . 498
squills . . . 514

Tincture thebaic . . 510. 521
of Virginian snake root . 500
white hellebore . . 514
Tobacco 281
Tonics 101
Toothach tree . . . 147
Tragacanth 157
Traumatic balsam . . . 500
Trituration 84
Troches of carbonate of lime . . 535
chalk . . . 535
liquorice with opium . 535
magnesia . . . 536
Tulip bearing poplar . . . xix. 257
Turmeric 204
Turner's cerate . . . 558
Turpentine, common . . . 304
oil of . . 303
Venice . . . 303
Turpeth, mineral . . . 450
Tutty 293
prepared . . . 455

V

Valerian, wild . . . 360
Varnish tree 321
Vegetable acids . . . 65
mineral water . . . 454
analysis . . . 47
Verdigris 347
Vine 363
Vinegar 125
distilled . . . 388
plant 320
Violet, March . . . 363
Vitrified oxide of antimony with sulphur, . 422
wax . 423
Vitriolated tartar . . . 399
Vitriol, blue . . . 349
green 433
white . . . 455
Vitriolic elixir proprietatis . . 515
acid . . . 127
diluted . . . 382
ether . . . 459
Volatile liniment . . . 469
oils . . . 475
tinctures . . . 517

W

Wake robbin . . . 152

Water . . . 31. 143
of acetated litharge . . 453
acetite of ammonia . . 409
ammonia . . . 409
caustic . . . 405
carbonic acid . . 391
avens 225
distilled . . . 472
potass 392
styptic . . . 431
dock 326
flag 244
Waters of Stafford spring . . 571
Wax, white . . . 178
yellow 178
Weights and measures . . 91
Wheat 357
White walnut . . . 245
precipitate of mercury . . 447
ointment . . . 550
Wild indigo 342
Willow, broad leaved . . 329
red 200
white . . . 329
Wine 363
American . . . 366
of gentian, compound . . 520
ipecacuan . . . 520
iron 519
opium, compound . . 521
rhubarb . . . 522
socotorine aloes . . 519
tartrite of antimony . . 522
tobacco . . . 521
Winter berry 310
Witch hazel . . . 227
Wolfsbane 130
Wood sorrel . . . 288
Worm seed 150
Wormwood, common . . 150

Y

Yellow ointment . . . 557
root shrub . . . 367
wood, prickly . . . 368

Z

Zinc 369
oxide of 454
impure . . . 293
prepared . 455

LATIN INDEX.

A

Acetis hydrargyri . . . 436
plumbi . . . 452
potassæ 398
Acetum aromaticum . . . 496
scillæ maritimæ . . . 496
Acidum acetosum . . . 125
camphoratum . . 497
distillatum . . 388
forte . . . 389
benzoicum . . . 67. 389
muriaticum . . 44. 387
nitricum . . . 44. 384
nitrosum . . 44. 383
dilutum . . 383
succinicum . . . 390
sulphuricum . . 127
aromaticum . . 516
dilutum . . 382
Acipenser sturio . . . 128
Aconitum napellus . . . 130
Acorus calamus . . . 131
Actea spicata . . . 131
Æsculus hippocastanum . . . 132
Æther sulphuricus . . . 459
cum alcohole . . 461
aromaticus 516
Agrimonia eupatoria . . . 133
Alcornoque . . . 370
Alcohol . . . 71. 133
ammoniatum . . 406
aromaticum . . 517
fœtidum . 474
dilutum . . . 134
Allium sativum . . . 135
Aloe perfoliata 136
hepatica . . . 136
socotorina . . . 136

Althæa officinalis . . . 137
Ammoniacum 138
Ammoniaretum cupri . . 430
Amomum repens . . . 139
zingiber . . . 138
Amygdalus communis . . . 139
Amyris gileadensis . . . 140
Anethum fœniculum . . . 140
graveolens . . . 141
Angelica 141
Angustura 142
Anthemis nobilis . . . 142
Aqua 143
acetitis ammoniæ . . 409
acidi carbonici . . . 391
ammoniæ . . . 405
citri aurantii . . . 472
carbonatis ammoniæ . . 409
calcis 413
super-carbonatis ferri . . 433
destillata 472
fortis . . . 384
tenuis . . . 383
lauri cinnamomi . . 472
lauri cassiæ . . . 473
lithargyri acetati . . 452
menthæ piperitæ . . . 472
pulegii . . 472
viridis . . . 472
myrti pimentæ . . 472
potassæ . . . 392
rosæ damascenæ . . 472
super-carbonatis potassæ . . 397
sodæ . . 402
Aralia spinosa 147
Arbutus uva ursi . . . 147
Arctium lappa . . . 148
Argemone mexicana . . 148
Argentum 149
vivum . . . 332
Aristolochia serpentaria . . . 149
Artemisia abrotanum . . 150
absinthium . . . 150
santonica . . . 150
Arum Americanum . . . 150
maculatum . . . 152
triphyllum . . . 153
Asarum europæum . . . 153
Asclepias decumbens . . . 154

Asclepias syriaca . . . 156
Astragalus tragacantha . . . 157
Atropa belladonna . . . 157
Avena sativa 162
Aurum 159

B

Balneum mariæ . . . 87
Bismuthum 163
Bitumen petroleum . . . 165
Bubon galbanum . . . 166

C

Calx 166
Cancer astacus . . . 167
pagurus . . . 167
Canella alba 167
Cantharis . . . 269
Capsicum annuum . . . 168
Carbo ligni . . . 169
Carbonas 171
ammoniæ . . . 407
barytæs . . . 172
calcis . . . 172
præparatus . . 414
ferri . . . 432
præcipitatus . . 432
magnesiæ . . . 416
potassæ, . . . 394
impurus . . 173
purissimus . . 395
sodæ . . . 402
impurus . . . 175
zinci impurus . . 176
præparatus . . 455
Carum carui . . . 176
Cassia fistula . . . 176
marilandica . . . 177
senna 177
Castor fiber . . . 177
Cataplasma aluminis . . . 546
sinapeos . . 546
lini . . . 545
dauci . . . 546
fermenti . . . 540
Centaurea benedicta . . . 178
Cera alba 178
flava 178
Ceratum simplex . . . 558

Ceratum carbonatis zinci impuri . 558
lithargyri acetati compositum . 550
sabinæ . . . 559
Cervus elaphus . . . 179
Chenopodium anthelminticum . . 179
Chironia centaurium . . . 180
Cicuta 195
Cinchona caribæa . . . 188
officinalis . . . 180
Citrus aurantium . . . 189
medica . . . 189
Cocos butyracea . . . 192
Coccus cacti . . . 191
Cochlearia armoracia . . . 192
officinalis . . 193
Coffea 193
Colomba 195
Conium maculatum . . . 195
Conserva citri aurantii . . 532
rosæ gallicæ . . . 532
Convolvulus jalapa . . . 197
panduratus 198
scammonia . . 197
Copaifera officinalis . . . 198
Corallium rubrum . . . 415
Coriandrum sativum . . . 199
Cornus florida . . . 200
sericea . . . 200
Crocus sativus . . . 201
Croton eleutheria . . . 202
Cucumis colocynthis . . 202
Cuprum 203
Curcuma longa . . . 204

D

Daphne mezereum . . . 204
Datura stramonium . . 205
tatula 205
Daucus carota . . . 208
Decoctum althææ officinalis . . 484
cinchonæ officinalis . . 484
daphnes mezerei . . 485
guajaci compositum . . 486
hordei distichi . . . 486
polygalæ senegæ . . 486
smilacis sarsaparillæ . . 487
Digitalis purpurea . . . 208
Dolichos pruriens . . . 215
Dorstenia contrajerva . . 216

E

Electuarium aromaticum . . 532
cassiæ fistulæ . . 533
sennæ . . . 533
catechu . . . 534
opiatum . . . 534
Emplastrum assæ fœtidæ . . 562
gummosum . . . 562
meloes vesicatorii . . 560
compositum . 560
hydrargyri . . 563
oxidi plumbi semivitrei . . 561
ferri rubri . . 564
resinosum . . . 562
compositum . 560
saponaceum . . 563
simplex . . 559
Emulsio amygdali communis . . 488
ammoniaci . . . 489
camphorata . . . 488
Eugenia caryophyllata . . 216
Eupatorium perfoliatum . . xxi. 217
pilosum . . 217
Extractum anthemidis nobilis . . 525
cassiæ sennæ . . . 525
cinchonæ officinalis . 526
convolvuli jalapæ . . 526
gentianæ luteæ . . 524
glycyrrhizæ glabræ . . 525
hæmatoxyli campechensis . 525
hellebori nigri . . 525
juglandis cinereæ . . 525
papaveris somniferi . . 525
rutæ graveolentis . . 525

F

Fecula 55
Ferrum 218
Ferri limatura purificata . . 431
oxidum nigrum . . 219
purificatum . . 431
Ferula assa fœtida . . . 219
Ficus carica 220
Frasera carolinensis . . . 221
Fraxinus ornus 222

G

Gambogia 223
Gentiana lutea . . . 223

Geoffræa inermis . . . 224
Geranium maculatum . . 224
Geum urbanum . . . 225
Glycyrrhiza glabra . . . 225
Guajacum officinale . . . 226

H

Hamamelis Virginiana . . 227
Hæmatoxylum campechianum . . 227
Helleborus fœtidus . . . 228
niger . . . 228
Heracleum sphondylium . . 229
Hirudo medicinalis . . . 230
Hordeum distichon . . . 231
Humulus lupulus . . . 231
Hydrargyrus . . - 232
purificatus . . 436
Hydro-sulphuretum ammoniæ . . 411
Hyoscyamus niger . . . 239
Hyssopus officinalis . . . 240

I

Ichthyocolla 128
Infusum cinchonæ officinalis . . 481
digitalis purpureæ . . 481
gentianæ compositum . . 482
mimosæ catechu . . . 482
rhei palmati . . 483
rosæ gallicæ . . . 483
tamarindi et sennæ . . 483
Inula helenium 241
Ipecacuanha . . . 241. 313
Iris pseudacorus . . . 244

J

Juglans cinerea . . . 245
Juniperus communis . . . 245
sabina . . . 246
Virginiana . . . 247

K

Kalmia latifolia . . . 247
angustifolia . . . 248
Kino 248

L

Lactuca sativa 250
virosa . . . 250
Laurus camphora . . . 252

Laurus cassia . . . 251
cinnamomum . . . 251
sassafras . . . 254
Lavandula spica . . . 255
Leonorus cardiaca . . . 256
Leontodon taraxacum . . . 255
Lichen islandicus . . . 256
Linementum hydrargyri compositum . 549
simplex . . 548
Linum usitatissimum . . . 257
Liquor arseni calis . . . 457
Liriodendron tulipifera . . xix. 257
Lobelia inflata . . . 258
syphilitica . . . 262
Lytta vittata . . . 262

M

Magnesia . . . 37. 419
Malva sylvestris . . . 264
Maranta arundinacea . . 264
Marrubium vulgare . . . 266
Mel 266
Melaleuca leucadendron . . . 267
Melia azedarach . . . 267
Melissa officinalis . . . 268
Meloe niger . . . 264
vesicatorius . . . 269
Mentha piperita . . . 270
pulegium . . . 271
viridis . . . 270
Mimosa catechu . . . 271
nilotica . . . 272
Mistura carbonatis calcis . . 489
ferri compositæ . . 435
Moschus moschiferus . . . 273
Mucilago amyli . . . 489
astragali tragacanthæ . . 490
mimosæ niloticæ . . 490
Murias 274
ammoniæ . . . 275
et ferri . . 434
antimonii . . . 425
barytæ . . . 411
hydrargyri . . . 438
sodæ . . . 276
Myrica cerifera humulis . . . 278
Myristica moschata . . . 278
Myroxylon peruiferum . . . 279
Myrrha 280
Myrtus pimenta . . . 281

N

Nicotiana tabacum . . . 281
Nigella 283
Nitras argenti . . . 429
potassæ 284

O

Olea Europæa . . . 286
Oleum ammoniatum . . . 469
amygdali communis . . 468
camphoratum . . . 470
carui . . . 477
fœniculi dulcis . . . 478
juniperi sabinæ . . 476
lini usitatissimi . . . 468
cum calce . . 469
succini et acidum succinicum . 390
purissimum . . 479
sulphuratum . . . 469
eugeniæ caryophyllatæ . . 216
juniperi communis . . 476
lauri cinnamomi . . 251
lavandulæ spicæ . . . 477
menthæ piperitæ . . 476
pulegii . . . 478
viridis . . 478
myristicæ moschatæ . . 278
myrti pimentæ . . 478
pimpinellæ anisi . . . 477
pini purissimum . . 478
rorismarini officinalis . . 477
Orchis mascula . . . 287
Ostrea edulis 287
Ovis aries 287
Oxalis acetosella . . . 288
Oxidum antimonii cum phosphate calcis . 424
sulphure per nitratum potassæ . 421
vitrificatum 422
vitrificatum cum cera . 423
arsenici . . . 288
ferri nigrum purificatum . . 431
rubrum . . 434
hydrargyri cinereum . . 418
rubrum per acidum nitricum 449
plumbi album . . . 292
rubrum . . 292
semi-vitreum . . 293
zinci . . . 454

Oxidum zinci impurum . . . 293
præparatum . 455

P

Panacea antimonii . . . 428
Papaver somniferum . 293
Phosphas calcis impurus . . . 416
sodæ . . . 403
Physeter macrocephalus . . . 300
Phytolacca decandra . . . 300
Pilulæ acetitis plumbi et ipecacuanhæ . 539
aloes et assæ fœtidæ . . 538
colocynthidis . . 538
myrrhæ . . 539
aloeticæ . . . 538
ammoniareti cupri . . 540
ferri cum myrrha . . . 543
gambogia compositæ . . 543
assæ fœtidæ compositæ . . 539
hydrargyri . . . 540
opiatæ 541
plummeri . . . 543
rhei compositæ . . . 542
scilliticæ . . . 542
Pimpinella anisum . . . 302
Pinus abies . . . 303
balsamea 303
larix . . . 303
sylvestris . . . 304
Piper longum . . . 305
nigrum 305
Plantago 305
Plumbum 306
Podalgria tinctoria . . . 342
Podophyllum peltatum . . . 306
Polygala senega . . . 307
Polygonum bistorta . . . 309
Polypodium filix mas . . 309
Potassa 393
cum calce . . . 394
Potassium 40
Prinos verticillatus . . . 310
Prunus lauro cerasus . . . 312
domestica . . . 311
Virginiana . . . 310
Pterocarpus santolinus . . 313
Pulparum extractio . . . 467
Pulvis aloes cum canella . . 531
asari compositus . . . 528

Pulvis carbonatis calcis compositus . 528
astragali tragacanthæ compositus . 531
cinnamomi compositus . . 527
ipecacuanhæ et opii . . . 529
jalapæ compositus . . 529
opiatus 530
scammonii compositus . . 530
super-sulphatis aluminæ et potassæ [compositus 530
tragacanthæ compositus . . 531

Q

Quassia excelsa . . . 313
simaruba . . . 314
Quercus cerris . . . 315
robur 314

R

Resina pini 316
Rhamnus catharticus . . . 316
Rheum palmatum . . . 317
Rhododendron crysanthum . . 319
Rhus copallinum . . . 320
glabrum . . . 320
radicans . . . 320
toxicodendron . . 321
typhinum . . . 320
vernix . . . 321
Ribes 323
Ricinus communis . . . 323
Rosa canina 325
damascena . . . 325
gallica . . . 324
Rosmarinus officinalis . . . 325
Rubia tinctorum . . . 326
Rumex Acutus . . . 327
aquaticus . . . 326
crispus . . . 327
Ruta Graveolens . . 327

S

Saccharum officinarum . . 328
Salix alba 329
latifolia . . . 329
Sal catharticus amarus . . 350
Salvia officinalis . . . 330
Sambucus nigra . . . 331
Sanguinaria canadensis . . 331
Sapo 333

Scatellaria lateriflora . . . 336
Scilla maritima . . . 335
exsiccata . . . 335
Secale cornutum . . . 335
Sesamum orientale . . . 339
Sinapis alba . . . 340
nigra . . . 340
Smilax sarsaparilla . . 341
Sodium . . . 41
Solanum dulcamara . . . 341
Solutio acetitis zinci . . . 457
muriatis barytæ . . 413
calcis . . . 415
sulphatis cupri composita . 431
Sophora tinctoria . . 342
Spigelia marilandica . . . 343
Spina cervina 316
Spiræa trifoliata . . . 343
Spiritus ætheris nitrosi . . 464
cari carui . . . 473
juniperi compositus . . 474
lauri cinnamomi . . 473
lavandulæ spicæ . . . 473
menthæ piperitæ . . 473
viridis . . . 473
myristicæ moschatæ . . 473
myrti pimentæ . . . 473
rorismarini officinalis . . 474
Spongia officinalis . . . 344
Stannum 345
Statice limonium . . . 345
Styrax benzoin . . . 346
Sub-acetis cupri 347
Sub-boras sodæ . . . 347
Sub-murias hydrargyri . . . 442
præcipitatus . 446
et ammoniæ . . 447
Sub-sulphas hydrargyri flavus . 450
Succinum 348
Succus spissatus aconiti napelli . . 464
atropæ belladonnæ . . 465
conii maculati . . 465
daturæ stramonii . . 466
hyoscyami nigri . 466
Sulphas barytes 349
cupri . . . 349
ferri 433
exsiccatus . . 434
magnesiæ . . . 350

Sulphas potassæ . . . 399
cum sulphure . . 400
sodæ . . . 404
zinci 455
Sulphur sublimatum . . . 351
lotum . . . 381
Sulphuretum antimonii . . . 352
præcipitatum . 423
præparatum . . 421
hydrargyri nigrum . 451
rubrum . . 451
potassæ . . 400
Super-tartris potassæ . . . 354
impurus . . 354
Super-sulphas aluminæ et potassæ . . 348
exsiccatus 420
Swietenia febrifuga . . . 355
mahagony . . . 355
Syrupus althææ officinalis . . 491
amomi zingiberis . . 492
citri aurantii . . . 492
citri medicæ . . 492
papaveris somniferi . . 492
rhamni cathartici . . 493
rosæ damascenæ . . . 493
gallicæ . . 494
scillæ maritimæ . . . 494
simplex . . . 491
toluiferæ balsami . . 494
violæ odoratæ . . 495

T

Tamarindus indica . . . 355
Tanacetum vulgare . . . 356
Tartris antimonii . . . 426
potassæ . . . 401
et sodæ . . . 405
Tinctura aloes ætherea . . 515
socotorinæ . . . 498
et myrrhæ . . 499
amomi repentis . . . 499
angusturæ . . . 502
aristolochiæ serpentariæ . . 500
benzoin composita . . 500
camphoræ . . . 501
castorei . . . 502
composita . . 517
cinchonæ officinalis . . 502
composita . . 503

Tinctura cinnamomi composita . . 507
colombæ 503
convolvuli jalapæ . . 504
croci sativi 501
digitalis purpureæ . . 504
eleutheriæ 501
ferulæ assæ fœtidæ . . 500
gentianæ composita . . . 505
guajaci ammoniati . . 517
officinalis . . . 505
hellebori nigri . . 506
humuli 515
hyoscyami nigri . . 506
kino 506
lauri cinnamomi . . 507
lavandulæ composita . . 507
meloes vesicatorii . . 508
fortior . . 508
mimosæ catechu . . 508
moschi 509
muriatis ferri . . 509
ammoniæ et ferri . . 509
myrrhæ 510
opii 510
ammoniata . . 518
camphorata . . 511
rhei dulcis . . . 513
et aloes . . . 512
et gentianæ . . 512
palmati . . . 512
saponis 513
et opii . . . 513
scillæ maritimæ . . 514
sennæ composita . . 502
toluiferæ balsami . . 514
veratri albi 514
Toluifera balsamum . . 356
Tormentilla erecta . . . 357
Triticum æstivum . . . 357
Trochisci carbonatis calcis . . 535
glycyrrhizæ cum opio . 535
magnesiæ 536
Tussilago farfara . . . 357

U

Ulmus Americana . . . 358
Unguentum acetitis plumbi . . 550
acidi nitrosi . . . 554
aquæ rosæ . . 551

Unguentum hydrargyri . . . 554
mitius . . 554
infusi meloes vesicatorii . 553
nitratis hydrargyri . 557
mitius . 557
oxidi hydrargyri cinerei . 556
rubri . . 556
plumbi albi . . 550
zinci . . . 558
impuri . . 558
physeteris macro cephali sevi . 549
picis . . . 552
pulveris meloes vesicatorii . 553
resinosum . . 552
rosarum . . . 551
simplex . . 548
stramonii . . . 551
sub-acetitis cupri . . 557
sub-muriatis hydrargyri et ammoniæ 556
sulphuris . . 553
Urtica dioica 359

V

Valeriana officinalis . . . 360
Veratrum album . . . 360
Vinum aloes socotorinæ . . 519
ferri 519
gentianæ compositum . . 520
ipecacuanhæ . . . 520
nicotianæ tabaci . . 521
opii compositum . . . 521
rhei palmati . . . 522
tartritis antimonii . . . 522
Viola odorata 363
Vitis vinifera 363

X

Xanthorhiza apiifolia . . . 367
tinctoria . . . 367
Xanthoxylum clava herculis . . 368
fraxini-folium . . 369

Z

Zincum 369

Med. Hist.
WZ
270
T359am
1813
c.1